

Interior Lights, Instruments and Instrument Panel Controls

GROUP
33

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PART 33-01 General Interior Lights, Instruments and Instrument Panel Controls Service

Refer to the Wiring and Vacuum
Diagrams Manual, Form 7795P-70
for schematics and locations of wiring

harnesses.
For diagnosis, refer to the Ford

Car Electrical Systems Diagnosis
Manual.

PART 33-02 Interior Lights, Indicator Lights and Switches

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A page number indicates that the item is for the vehicle(s) listed at the head of the column.

N/A indicates that the item is not applicable to the vehicle(s) listed.

1 SWITCHES

DUAL BRAKE INDICATOR LIGHT AND SWITCH ASSEMBLY

DESCRIPTION AND OPERATION

The dual brake system on all vehicles has a dual brake indicator light and switch incorporated in the system. The function of the light and switch is to indicate the operating condition of either the front (primary) or rear (secondary) brake system.

The switch assembly is located on the pressure differential valve on the master cylinder and activates a dual brake indicator light located on the instrument panel (See Group 12). When the ignition switch is turned to the start position, the dual-brake indicator light provides a visual indication that the bulb is functional. If the light comes on when the ignition switch is turned to the ON or ACC position, one portion of the dual-brake system has become inoperative.

SWITCH REMOVAL AND INSTALLATION

1. Disconnect the brake indicator

light wire from the switch (mounted on the pressure differential valve assembly). To prevent damage to the switch wire connector, expand the plastic lugs to allow removal of the shell-wire connector from the switch body.

2. Remove the switch from the pressure differential valve.

3. Install the new switch in the pressure differential valve.

4. Connect the shell-wire connector to the brake indicator light switch. Make sure that the plastic lugs on the connector hold the connector securely to the switch.

Refer to Group 12, Brakes for centralizing differential valve procedures.

STOP LIGHT SWITCH

DESCRIPTION AND OPERATION

The mechanical stoplight switch assembly is installed on the pin of the brake pedal arm so that it straddles the master cylinder push rod (Fig. 1). The switch assembly is a slip fit on the pedal arm pin and thus the switch assembly moves with the pedal arm

whenever the brake pedal is depressed.

The brake pedal arm pin has a designed-in clearance with the eye of the master cylinder push rod (Fig. 1). Because of this clearance, whenever the brake pedal is pushed forward, the stop light switch contacts, moving with the pedal arm, are actually pushed against the end of the master cylinder push rod, through the switch actuating pin. It is this movement of the switch with respect to the actuating pin and master cylinder push rod that closes the switch contacts completing the circuit to the stoplights.

When the brake pedal is released, the spring in the stop light switch returns the actuating pin to its normal position and the circuit to the stop lights opens.

SWITCH REMOVAL AND INSTALLATION

1. Disconnect the wires at the connector.
2. Remove the hairpin retainer, slide the stoplight switch, the push rod and the nylon washers and bushing away from the pedal, and remove

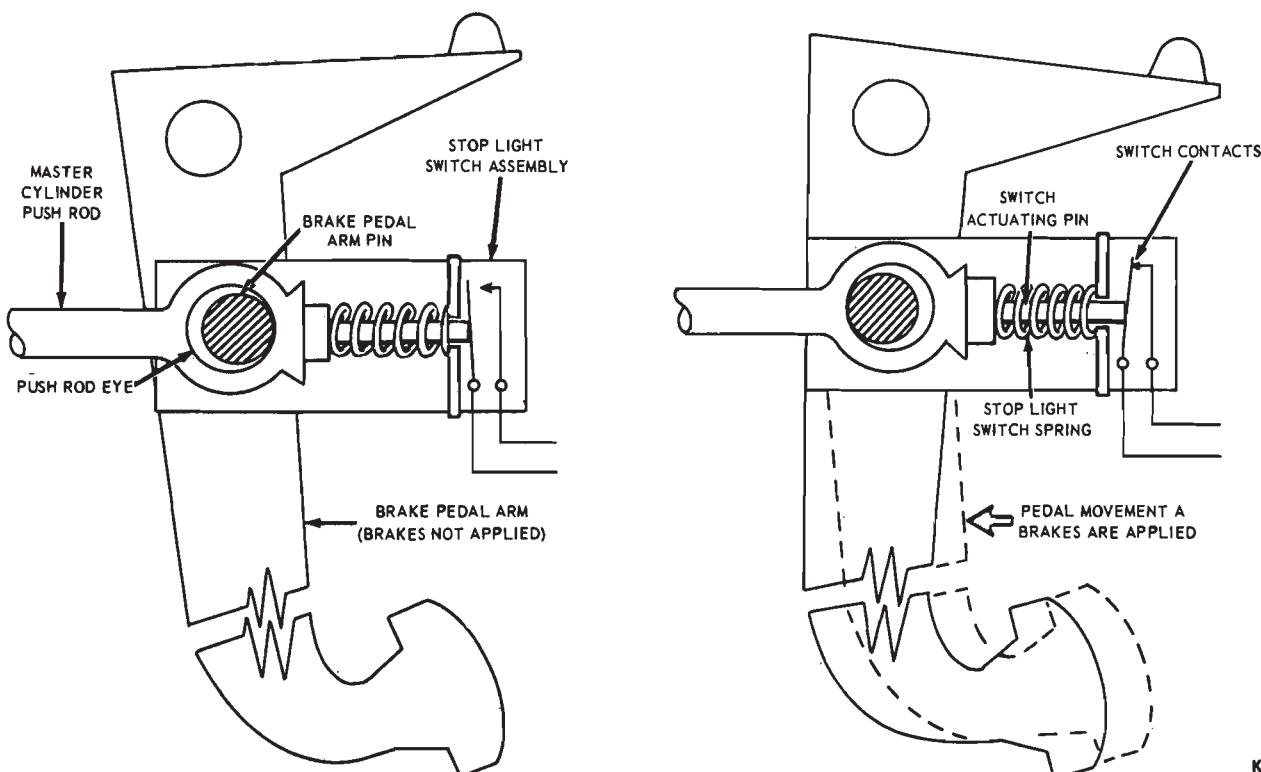


FIG. 1—Mechanical Stop Light Switch Operation

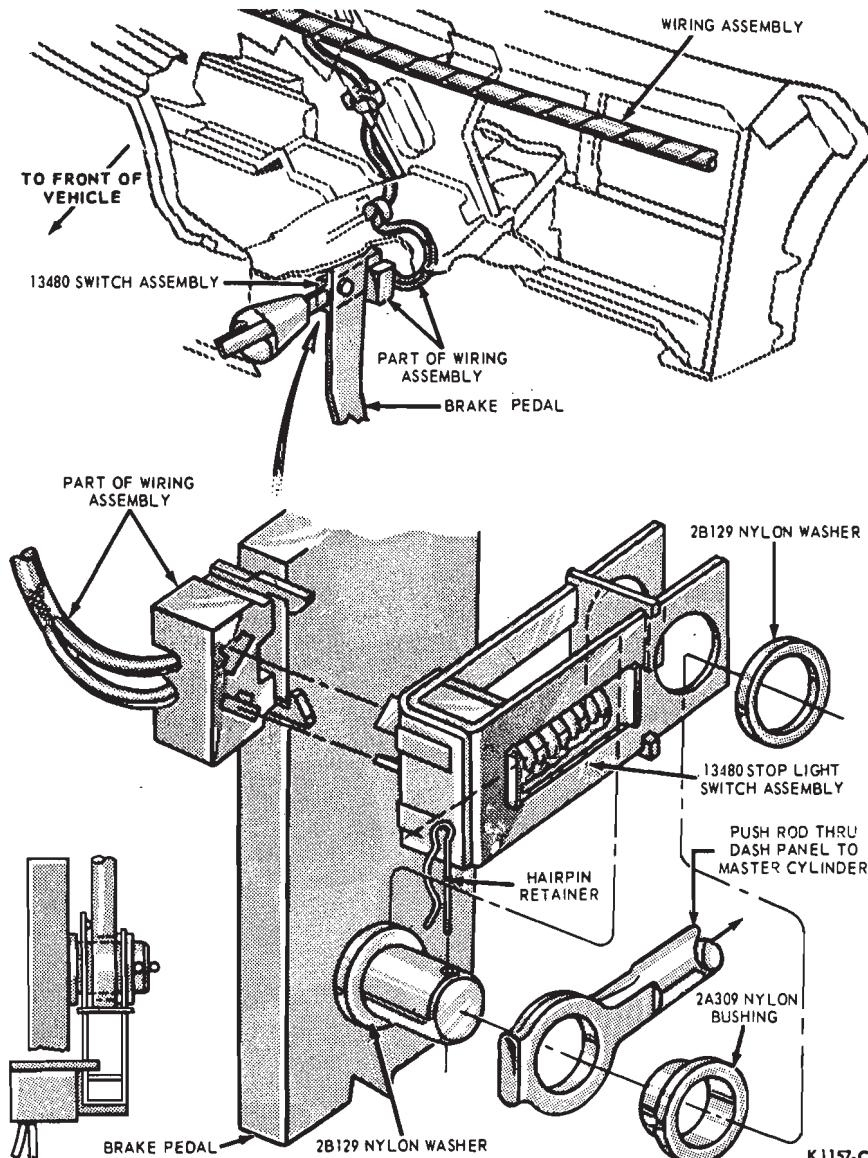


FIG. 2—Typical Stop Light Switch Installation

the switch (Fig. 2).

3. Position the switch, push rod, and bushing and washers on the brake pedal pin, as shown in Fig. 2, and install the hairpin retainer.

4. Connect the wires at the connector, and install the wires in the retaining clip (Fig. 2).

BACK-UP LIGHT SWITCH REPLACEMENT

Before replacing a back-up light switch, be sure to check the condition of the light bulbs.

Since all back-up light switches are operated by the transmission selector lever, replacement procedures differ according to mounting location of the selector lever and type of transmission used.

COLUMN MOUNTED

With Automatic Transmission

1. Disconnect the back-up light switch wires at the plug connector. On Thunderbird and Lincoln Continental, disconnect the two parking brake release vacuum hoses.

2. Remove the two screws securing the back-up light switch to the steering column and lift the switch from the column.

Check the column to be sure that the metal switch actuator is secure to the shift tube and that it is seated as far forward against the shift tube bearing as is possible. Also check for a broken or damaged actuator. If it is broken or damaged, replace it as

shown in Fig. 3.

3. Before installing a new switch to the column, check to see that the drive position gauge is inserted in the drive pinning hole. If the pin is missing, align the two holes at the drive pinning hole on top of the switch and install a No. 43 drill or 0.092-0.093 inch gauge pin.

4. While holding the selector lever against the stop in the drive detent position, place the switch on the column and install the two attaching screws. Tighten the screws to 20 in-lbs torque.

5. Remove the gauge pin (or No. 43 drill if used).

6. Connect the switch wires to the plug connector. On Thunderbird and Lincoln Continental, connect the two parking brake release vacuum hoses.

With Manual Transmission

The switch is mounted at the lower end of the steering column but does not require pinning in any position.

Remove the wire retaining clip (one screw) from the brake pedal support extension. Disengage the switch wiring from the clip and disconnect at the plug connector. Remove the switch from the steering column (two retaining screws).

When installing the switch, route the wiring from behind the back face of the clip and around through the clip jaws, and then mount the clip and wiring to the brake pedal support extension.

FLOOR OR CONSOLE MOUNTED—AUTOMATIC TRANSMISSION

Vehicles equipped with a floor or console mounted automatic transmission still have a neutral start switch. On these vehicles, the back-up light switch is an integral part of the neutral start switch. For removal and installation, refer to Group 17.

FLOOR MOUNTED—MANUAL TRANSMISSION

3-Speed

Place the shift control lever in neutral and raise the vehicle on a hoist. Disconnect the switch lead wires at the connector, and remove the switch and bracket assembly (one retaining bolt) from the selector lever support bracket. Install a new switch, bracket and wiring assembly to the support bracket and connect the wires.

4-Speed

Place the shift control lever in neutral and raise the vehicle on a hoist. Disconnect the electrical connector from the switch and pull the switch from the shift control assembly by slightly rotating in both directions. Be sure that the switch retainer is removed from the switch.

Index a new switch retainer in the shift control, and then index the switch into the retainer as far as possible without forcing it. Connect the electrical connector to the new switch.

AUTOMATIC MAP LIGHT AND SEAT BELT LIGHT DELAY SYSTEM**DESCRIPTION AND OPERATION**

When the map light switch is in the OFF position, the map light and map light switch on the Continental Mark III, Thunderbird, and Lincoln Continental are connected to a thermal switch in parallel with the seat belt light(s) (Fig. 4).

Opening the driver's door closes the door jamb switch connecting battery power through the heating coil of the thermal switch to ground. This heating of the coil causes the bi-metal arm to deflect and close the contacts, thus completing the light circuit through the thermal switch to ground.

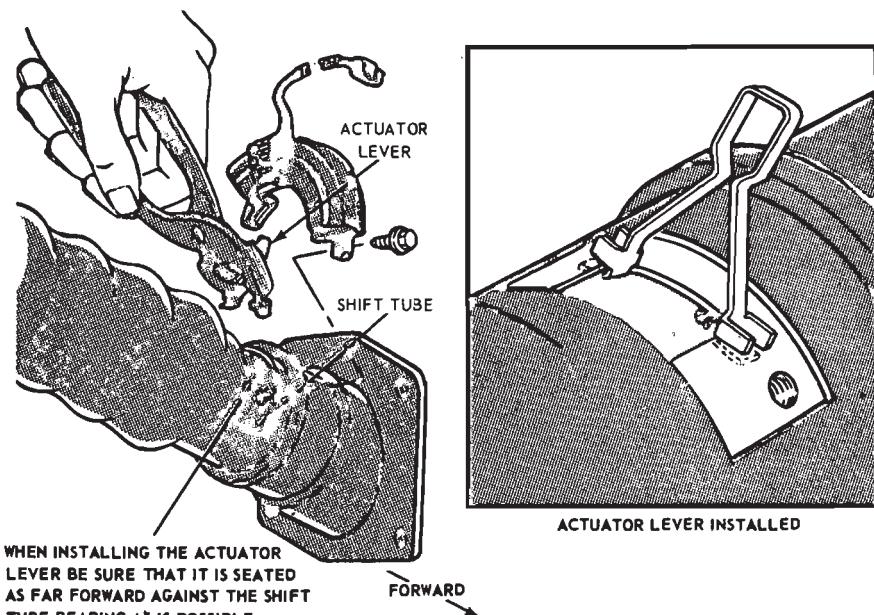
Closing the door opens the door jamb switch, breaking the circuit through the heating coil in the thermal switch. The coil and bi-metal arm, however, require 7 to 15 seconds to cool before the arm can return to its normal position and break the contacts. Thus the lights stay on 7 to 15 seconds after the door is closed.

THERMAL SWITCH REMOVAL AND INSTALLATION

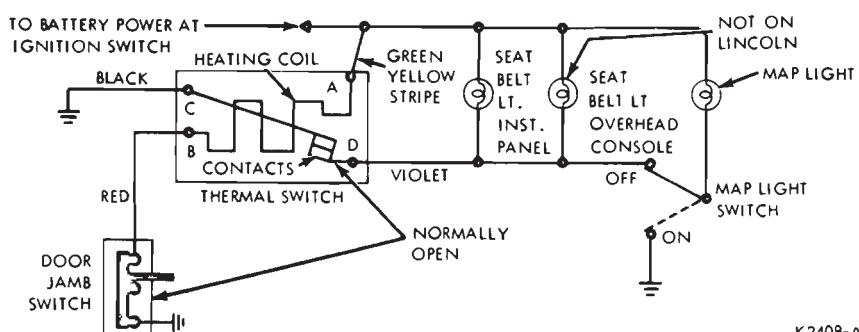
On the Thunderbird and Continental Mark III, the switch is mounted to the brake pedal support. On the Lincoln Continental, the switch is mounted to the instrument panel behind the glove box. Disconnect the wiring from the switch terminals and remove the retaining screw.

THERMAL SWITCH TEST

Disconnect and remove the switch. Connect battery voltage to the battery terminal, (terminal A on the switch, Fig. 4), and connect terminal B to ground. Connect a test light between



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FIG. 3—Removing or Installing Back-Up Light Switch and Actuator Lever—Column Mounted With Automatic Transmission

K2408-A

FIG. 4—Map Light and Seat Belt Light Delay—Thunderbird, Typical of Continental Mark III and Lincoln Continental

terminals C and D (across the points). If the test light comes on, the switch is OK. If the test light does not come on, replace the switch.

IGNITION SWITCH—EXCEPT FALCON

Refer to 1969 Car Shop Manual for Falcon information.

DESCRIPTION AND OPERATION

The ignition switch is mounted on the steering column and is controlled by the lock cylinder through an actuator in the locking mechanism (Fig. 5). On vehicles equipped with a steering column-mounted gearshift lever, the switch plunger is connected to the

actuator by the switch actuator rod (Fig. 5). On vehicles with a floor or console-mounted gearshift lever, the switch is mounted higher up on the column so that the plunger is connected directly to the actuator by a pin.

The lock cylinder also controls the mechanism which provides a positive lock for the transmission linkage and the steering system. This locking mechanism, located in the casting at the upper end of the steering column (Fig. 5), is described in Group 3.

The lock positions are ACC, LOCK, OFF, RUN and START as shown in Fig. 6. With automatic transmissions, the ignition key can be removed from the lock cylinder only when the shift lever is in PARK position and the key is in LOCK position.

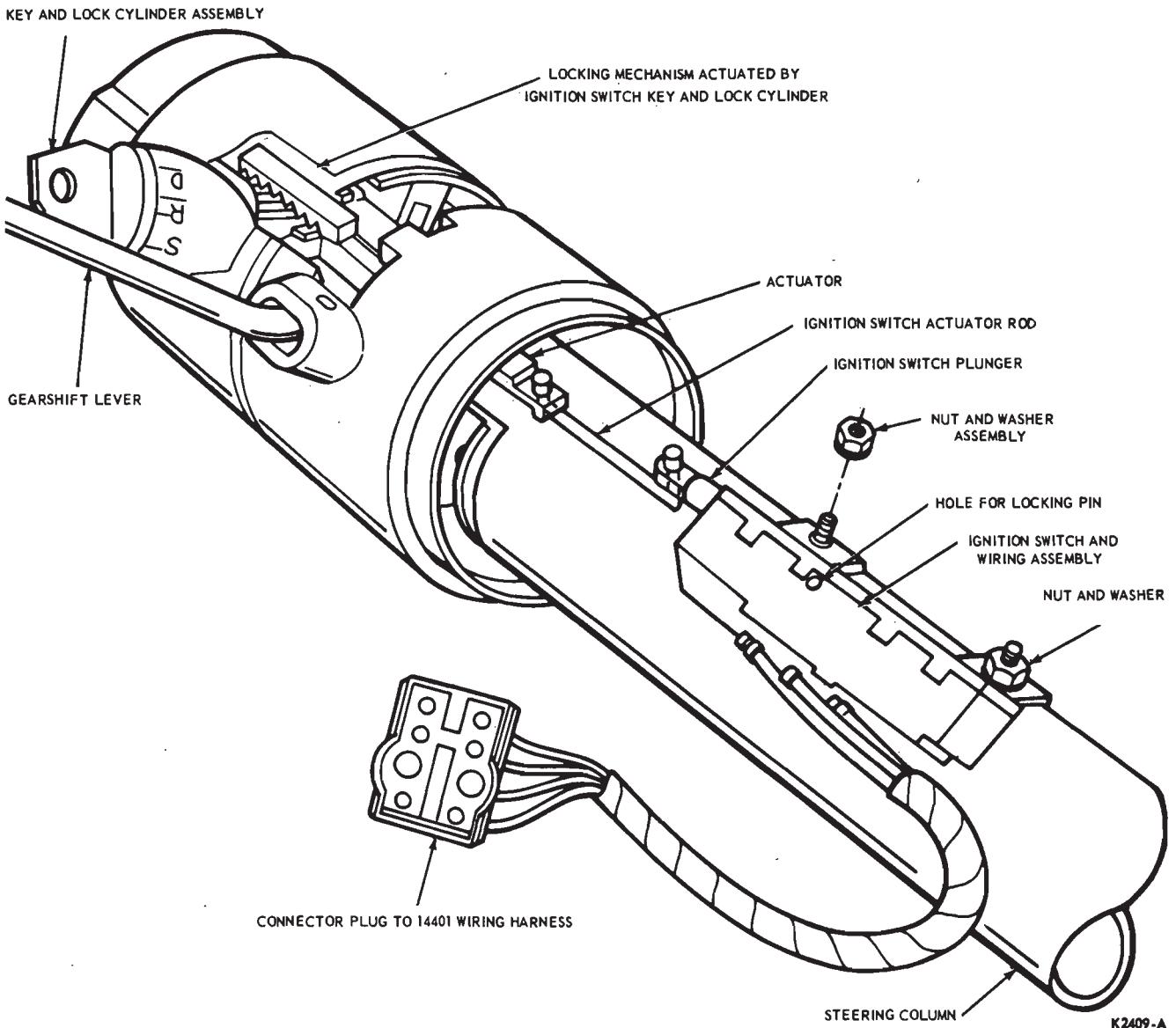


FIG. 5—Typical Ignition Switch Installation—Column-Mounted Gear Shift Lever Shown

With manual transmissions, the shift lever has to be in REVERSE position with the key in LOCK to remove the key. The ACC position operates while the steering and transmission systems remain locked. Turning the key to OFF position shuts off the engine without locking the steering or transmission systems.

CONTINUITY TEST

Disconnect the switch wire multiple plug.

Test the continuity through the switch by connecting a self powered test light or ohmmeter between the plug terminals indicated for each switch position in Fig. 6.

SWITCH REMOVAL AND INSTALLATION

1. To gain access to the switch, remove the shrouding from the steering column, and detach and lower the steering column from the brake support bracket as described under Steering Column Removal in Group 13.

2. Disconnect the battery cable.
3. Disconnect the switch wiring at the multiple plug.

4. Remove the two nuts that retain the switch to the steering column.

5. On vehicles with a steering column-mounted gearshift lever, detach the switch plunger from the switch actuator rod and remove the switch (Fig. 5).

On vehicles with a floor or console-mounted shift lever, remove

the pin that connects the switch plunger directly to the actuator and remove the switch.

6. When installing the ignition switch, both the locking mechanism at the top of the column and the switch itself must be in LOCK position for correct adjustment.

To hold the mechanical parts of the column in LOCK position, move the shift lever into PARK (with automatic transmissions) or REVERSE (with manual transmissions), turn the key to LOCK position, and remove the key.

New replacement switches, when received, are already pinned in LOCK position by a plastic shipping pin inserted in a locking hole on top of the switch.

For an existing switch, pull the



Group 13.

**SWITCH
ADJUSTMENT—EXISTING
SWITCH**

1. Perform steps 1, 2 and 3 of the foregoing procedure.

2. Move the shift lever into PARK (with automatic transmissions) or REVERSE (with manual transmission), turn the key to LOCK position, and remove the key. This procedure holds the mechanical parts of the column in LOCK position.

3. Loosen the ignition switch retaining nuts.

4. Pull the switch plunger out as far as it will go, and then move it in one detent to LOCK position. Insert a 3/32-inch diameter wire or drill shank in the locking hole on top of the switch (Fig. 5). The switch is now pinned in LOCK position.

5. Perform steps 9, 10 and 11 of the foregoing procedure.

**LOCK CYLINDER REMOVAL
AND INSTALLATION**

1. Disconnect the battery ground cable.

2. Fixed Steering Column Units—Remove the steering wheel trim pad and the steering wheel. Insert a wire pin in the hole located inside the column halfway down the lock cylinder housing (Fig. 7).

Tilt Steering Column Units—Insert a wire pin in the hole located on the outside of the flange casting next to the emergency flasher button (Fig. 7).

3. Place the gear shift lever in PARK (with automatic transmissions) or REVERSE (with manual transmissions) position, and turn the lock cylinder with the ignition key to RUN position.

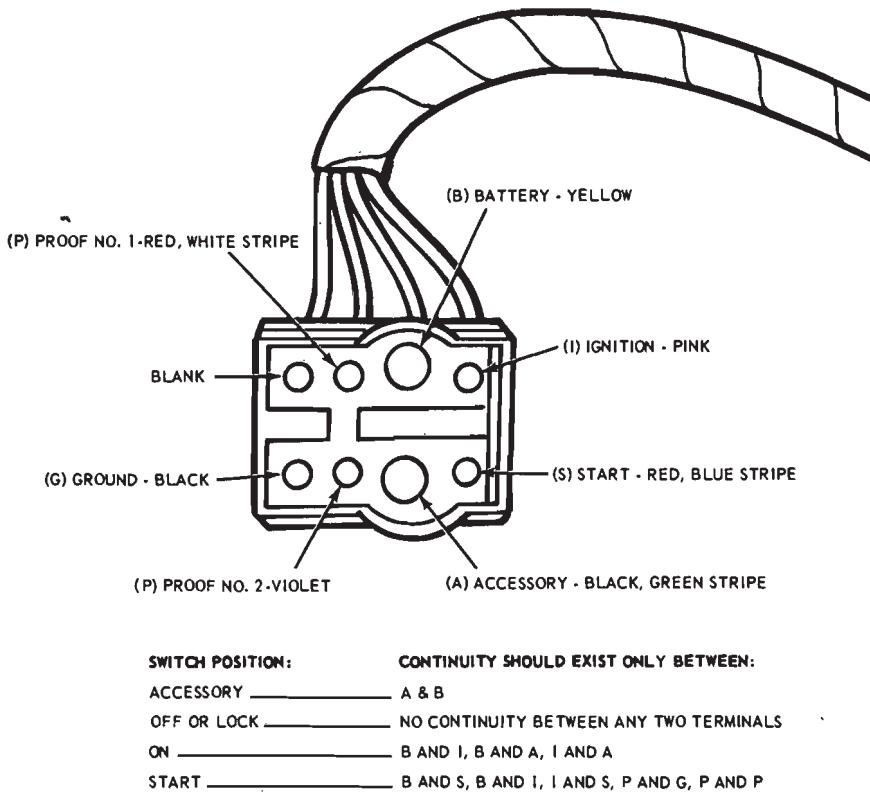
4. Depress the wire pin while pulling up on the lock cylinder to remove. Remove the wire pin.

5. Insert the lock cylinder into its housing in the flange casting, and turn the key to OFF position. This action will extend the cylinder retaining pin into the cylinder housing.

6. Turn the key to check for correct operation in all positions.

7. On fixed column units, install the steering wheel and trim pad.

8. Connect the battery cable.



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FIG. 6—Ignition Switch Continuity Test

switch plunger out as far as it will go and then move it in one detent to LOCK position. Insert a 3/32-inch diameter wire or drill shank in the locking hole on top of the switch (Fig. 5). The switch is now pinned in LOCK position.

7. On a vehicle with a steering column-mounted gearshift lever, connect the switch plunger to the switch actuator rod (Fig. 5).

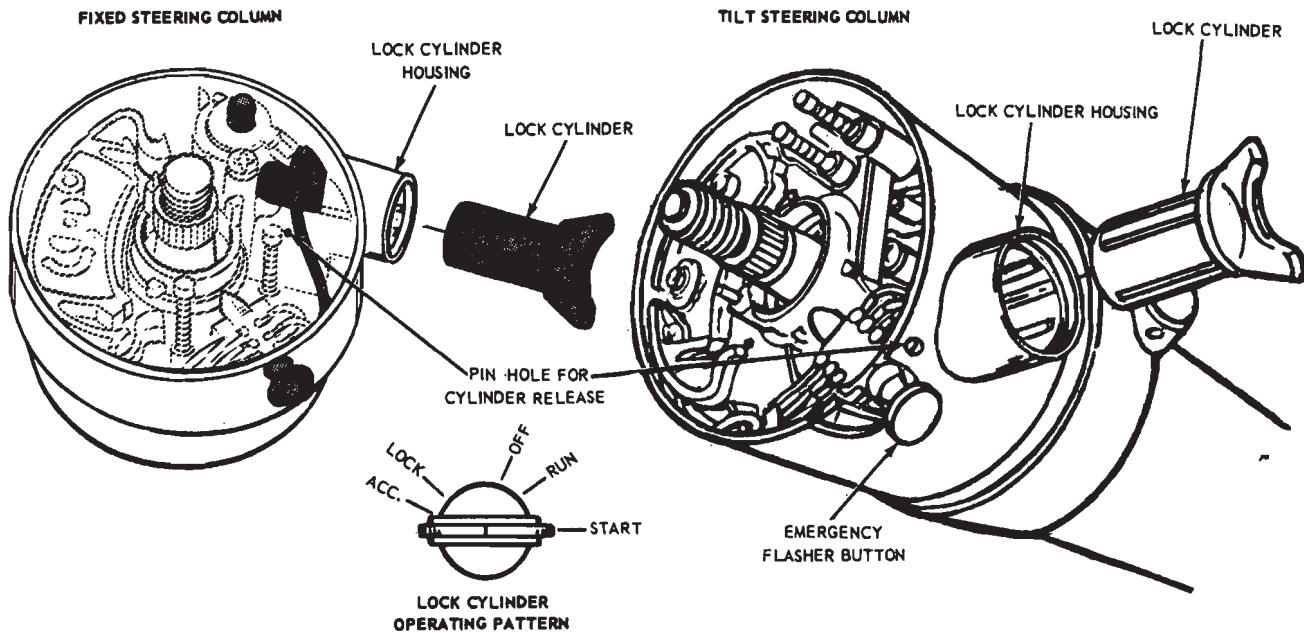
On a vehicle with a floor or console-mounted shift lever, position the hole in the end of the switch plunger to the hole in the actuator and install the connecting pin.

8. Position the switch on the column and install the retaining nuts, but do not tighten them.

9. Move the switch up and down along the column to locate the mid-position of rod lash, and then tighten the retaining nuts.

10. Remove the (plastic or substitute) locking pin, connect the battery cable, and check for proper start in PARK or NEUTRAL.

11. Attach the steering column to the brake support bracket and install the shrouding as described under Steering Column Installation in



K2411 A

FIG. 7—Lock Cylinder Removal and Installation

2 INTERIOR AND INDICATOR LIGHTS

REAR LIGHT MONITOR—THUNDERBIRD AND CONTINENTAL MARK III

DESCRIPTION AND OPERATION

The rear light monitor assembly is shown in Fig. 8. The system is composed of flexible plastic rods which extend from the rear lights to the monitor mounted on the package tray. Light induced into one end of the rod at the rear lights travels through the rod to the monitor. If a light is not lit, the monitor jewel for that light will not glow.

REMOVAL

1. Thunderbird. Remove the luggage compartment rear liner and disconnect the plastic rods from the light body.

Continental Mark III. From inside the luggage compartment, pull aside

the side trim panels and remove the two retaining nuts from the studs of both rear light bodies. Pull the light bodies to the rear just far enough to gain access to the ends of the fiberoptic plastic rods (Fig. 8). Disconnect the rods from the light bodies.

Thunderbird and Continental Mark III. In this and all following steps, handle the fiberoptic rods with care to avoid damaging them.

2. Loosen or remove the retaining clips as necessary to free the fiberoptic rods along both sides of the luggage compartment. Do not pull or force the rods through any tight fitting clips.

3. From the passenger compartment, remove the screws retaining the package shelf trim panel. Pull and tilt the panel forward far enough to gain access to the bottom surface of the trim panel. Carefully pull the rods through the side retainer loops at both sides of the package shelf sheet metal while moving the trim panel.

4. Remove the two screws that fasten the rod retainer to the lower surface of the package shelf trim panel, and remove the retainer. (These two screws also retain the monitor console to the package shelf.)

5. Remove and discard the four strips of tape that hold the rods to the forward edge of the trim panel, and carefully remove the rods from the side retainer loops.

6. Remove the console and rod assembly from the trim panel by working the rods through the grommet in the trim panel.

INSTALLATION

1. Feed the fiberoptic rods through the grommet from the top surface of the package shelf trim panel. Lay the free end of the rod for the left console indicator lens toward the left side of the car, and lay the free end of the rod for the right console indicator lens toward the right side of the car.

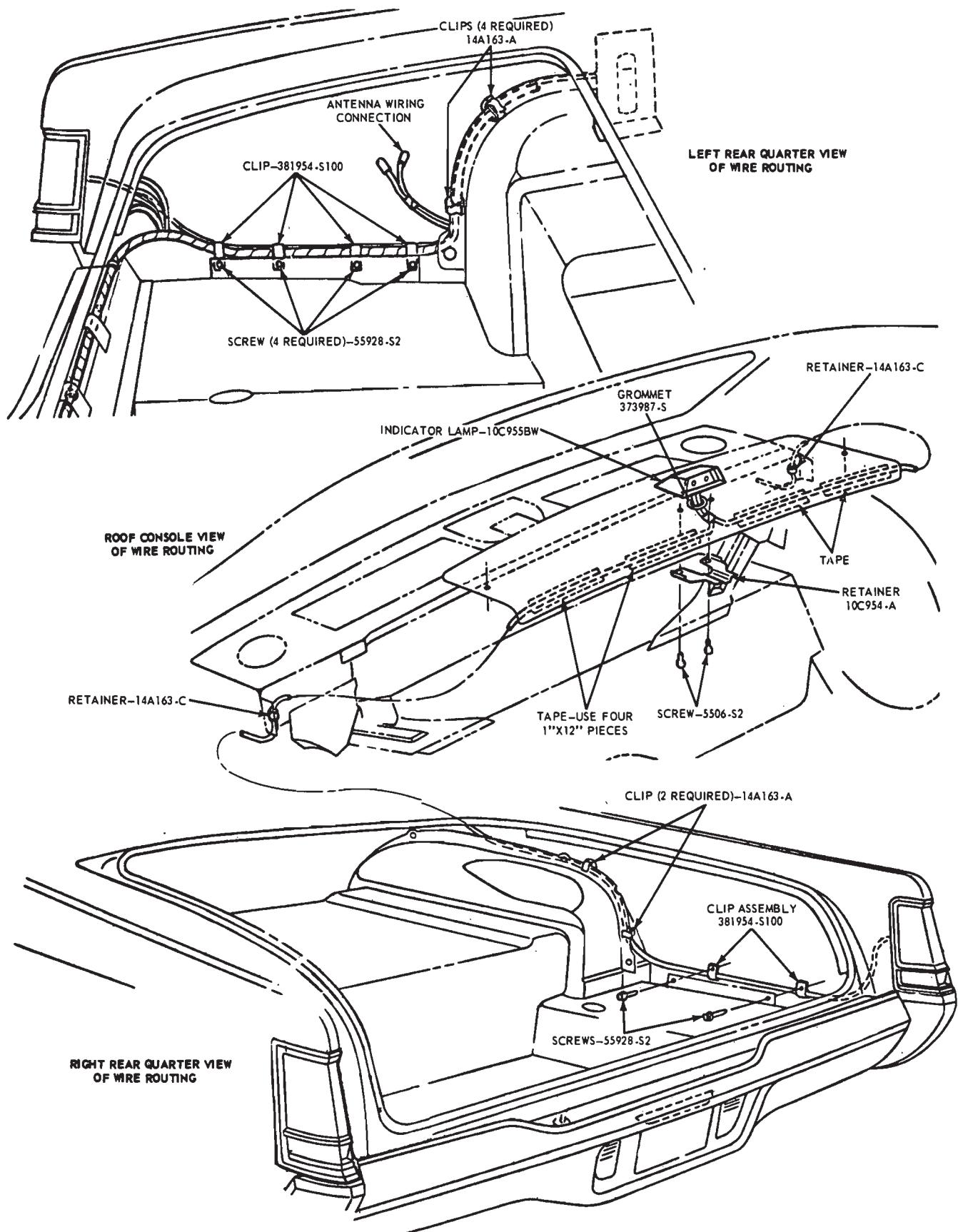


FIG. 8—Rear Light Monitor—Continental Mark III, Thunderbird Typical

K2397-A

2. Position the retainer so it holds the rods toward the forward edge of the trim panel, and install the two screws that fasten the retainer and console to the trim panel.

3. Cut four pieces of 1 inch tape, each about 1 foot in length, and tape both rods to the bottom surface of the trim panel, close to the forward edge.

4. Guide the ends of the rods through the loop retainers at the sides of the package shelf sheet metal and toward the rear of the luggage compartment. Work the rods through the retainers while moving the trim panel into position.

5. Install the package shelf trim panel.

6. Route the rods along the sides of the luggage compartment (the left rod is routed with the luggage compartment wiring assembly at the side of the compartment). Install or tighten the retaining clips.

7. On Thunderbird vehicles, connect the plastic rods to the rear light body and install the luggage compartment rear liner. On Continental Mark III vehicles, install the ends of the rods in the rear light bodies and install the rear light bodies to the quarter panels. Fasten the luggage compartment trim panels in place.

INSTRUMENT CLUSTER LIGHTS

To change an instrument cluster indicator or illumination bulb, follow the appropriate removal and installation procedures according to car line. Refer to Part 33-03, Sections 7 through 16.

TRANSMISSION CONTROL SELECTOR LIGHT

FLOOR MOUNTED— MUSTANG AND COUGAR

1. Remove the four retaining screws from the selector lever cover and dial indicator on the floor.

2. Lift the lever cover assembly and replace the bulb.

3. Position the cover to the floor and install the four cover retaining screws.

INSTRUMENT PANEL MOUNTED

On Ford, Meteor and Mercury vehicles, the light is mounted on the instrument panel. The light can be replaced from behind the panel.

CONSOLE MOUNTED

1. Remove the finish panel from the console.

2. Remove the quadrant bezel.

3. Position the selector lever in the one position and remove the light socket and bulb from its retainer.

4. Replace the bulb and install the socket in the retainer.

5. Install the quadrant bezel.

6. Position the finish panel and install the retaining screws.

STEERING COLUMN MOUNTED

Fixed Column

For access to the light bulb remove the horn switch assembly (one retaining screw at underside of each steering wheel spoke) and the steering wheel (Tool 3600 AA). Remove the turn signal switch lever (unscrew). Remove the three retaining screws and lift the turn signal switch out of the way. Do not disconnect or remove the switch and wiring. Remove the light bulb from the flange casting.

Tilt Column

On vehicles with a tilt column, the light bulb is installed at the base of the flange casting. Remove the cover from the steering column for access. Replace the bulb.

On Mustang, Cougar, and Fairlane, the cover is removed by pressing up on the left side and down on the right side. On other car lines, a two-piece cover is retained by screws.

HEATER CONTROL LIGHT—CONTINENTAL MARK III

Remove the cover plate in the trim panel below the steering column and reach up to the heater control assembly to replace the bulb.

COURTESY LIGHTS—CONTINENTAL MARK III

Front compartment foot well courtesy lights are mounted on the lower flange at both ends of the instrument panel. The bulbs are accessible from under the instrument panel for replacement without removing other parts.

Courtesy lights are also located at the rear of both door arm rests. The arm rest finish panel must be removed (refer to Group 47) for access

to the light components. To change the bulb, remove the two nuts from the studs on the light door and separate the light door and lens from the light body. Replace the bulb. Position the light door and lens to the arm rest finish panel and light body, and install the nuts to the studs. Install the arm rest finish panel.

MAP LIGHT AND SWITCH—THUNDERBIRD, CONTINENTAL MARK III AND LINCOLN CONTINENTAL

The map light and switch mounted in the center of the instrument panel pad are accessible for service by removing the two retaining screws in the map light trim plate. To change the bulb, lift the lens off the light body after removing the retaining screws and replace the bulb in the socket. Then position the lens to the light body, position the assembly in the recess in the instrument panel pad, and install the two screws.

To replace the switch, remove the two retaining screws in the trim plate and pull the assembly out far enough to disconnect the wiring connector. Remove the two screws retaining the switch to the assembly, disconnect the bullet connector, remove the switch knob, and remove the switch. Position the new switch to the back of the light body, install the two switch retaining screws and connect the bullet connector. Install the switch knob. Connect the wiring connector to the instrument panel wiring assembly connector and install the map light and switch assembly to the instrument panel pad with the two retaining screws.

OVERHEAD CONSOLE INDICATOR LIGHTS—CONTINENTAL MARK III

Indicator lights for luggage compartment deck lid open, door ajar, seat belts, and headlight covers not open are mounted in an overhead console. To change an indicator light bulb, pull the light body and socket assembly out of the console. Turn the light body counterclockwise to separate the light body from the socket. Remove the bulb by turning it counterclockwise, and install a new bulb. Install the light body to the socket, and press the assembly into position in the console, making sure that the nomenclature on the lens is in the proper position.

**READING LIGHTS—CONTINENTAL
MARK III**

Rear seat reading lights are mounted in the rear pillar trim panels and controlled by switches in the rear seat arm rests. To replace a bulb or the entire light assembly, pull the reading light assembly from the trim panel. Replace the bulb, or disconnect the wiring connector and replace the assembly, as required. Press the light

assembly into the trim panel.

**LUGGAGE COMPARTMENT
LIGHT—CONTINENTAL MARK III**

The luggage compartment light is mounted in the deck lid reinforcing panel, near the rear edge of the deck lid. To replace the bulb, remove the lens.

To remove the luggage compartment light assembly, disconnect the

two-wire connector just outboard of the left deck lid hinge. Free the wires from the wiring retainer clips and attach a pull-through cord to the connector.

Use the pull-through cord to pull the wires of the new light assembly into position. Install the light assembly and place the wires in the retainer clips after connecting the wire connector.

PART 33-03 Instruments, Clusters and Controls

COMPONENT INDEX Applies to Models As Indicated	All Models	Ford	Mercury	Meteor	Cougar	Fairlane	Falcon	Maverick	Montego	Mustang	Lincoln- Continental	Thunderbird	Continental- Mark III
AMMETER													
Description and Operation		N/A	N/A	N/A	03-07	N/A	N/A	N/A	03-07	03-07	03-07	03-07	03-07
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CHARGE INDICATOR LIGHT													
Description and Operation		03-07	03-07	03-07	03-07	03-07	03-07	03-07	03-07	03-07	N/A	N/A	N/A
Removal and Installation		03-11	03-11	03-11	03-13	03-21	03-16	03-18	03-23	03-13	N/A	N/A	N/A
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Removal and Installation		03-11	03-11	03-11	03-13	03-21	03-16	03-18	03-23	03-13	N/A	N/A	N/A
Testing		03-06	03-06	03-06	03-06	03-06	03-06	03-06	03-06	03-06	N/A	N/A	N/A
LOW FUEL LEVEL LIGHT													
Description and Operation		03-03	N/A	N/A	03-03	N/A	N/A	N/A	N/A	N/A	03-03	03-03	03-03
Testing		03-04	N/A	N/A	03-04	N/A	N/A	N/A	N/A	N/A	03-04	03-04	03-04
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Description and Operation		N/A	N/A	N/A	03-06	N/A	N/A	N/A	03-06	03-06	03-06	03-06	03-06
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COMPONENT INDEX Applies to Models As Indicated	All Models	Ford	Mercury	Meteor	Cougar	Fairlane	Falcon	Maverick	Montego	Mustang	Lincoln- Continental	V Thunderbird	Continental- Mark III
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Description and Operation	N/A	N/A	N/A	03-05	03-05	N/A	N/A	03-05	03-05	03-05	03-05	03-05	03-05
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Removal and Installation	03-11	03-11	03-11	N/A	N/A	03-16	03-18	03-23	N/A	N/A	N/A	N/A	N/A
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A page number indicates that the item is for the vehicle(s) listed at the head of the column.
N/A indicates that the item is not applicable to the vehicle(s) listed.

1 INSTRUMENT VOLTAGE REGULATOR

DESCRIPTION AND OPERATION

The instrument voltage regulator (Fig. 1) used with the fuel, temperature, and oil gauges maintains an average value of 5.0 volts at the gauge terminals.

The regulator operates by means of a bimetallic arm and a heating coil. When the ignition switch is turned on, the heating coil (Fig. 1) heats the bimetallic arm causing it to deflect and break the contacts, disconnecting the voltage supply from the heating coil. The bimetallic arm then cools and brings the contacts together again. The making and breaking of the contacts, causes a pulsating voltage, with an effective average value of 5.0 volts to be supplied to the gauges. Although these pulsations are quite rapid, there is in each gauge a bimetallic arm which changes temperature quite slowly, assuring steady average readings.

To prevent the pulsating voltage from causing radio interference, a radio suppression choke is connected in series between the printed circuit and the instrument voltage regulator.

INSTRUMENT VOLTAGE REGULATOR TEST AT SENDING UNIT

The instrument voltage regulator may be tested in the vehicle. To test, disconnect the fuel, oil, or temperature gauge lead from the terminal at the appropriate sender unit. Connect the lead of a 12 volt test light or the positive lead of a volt meter (20 volt

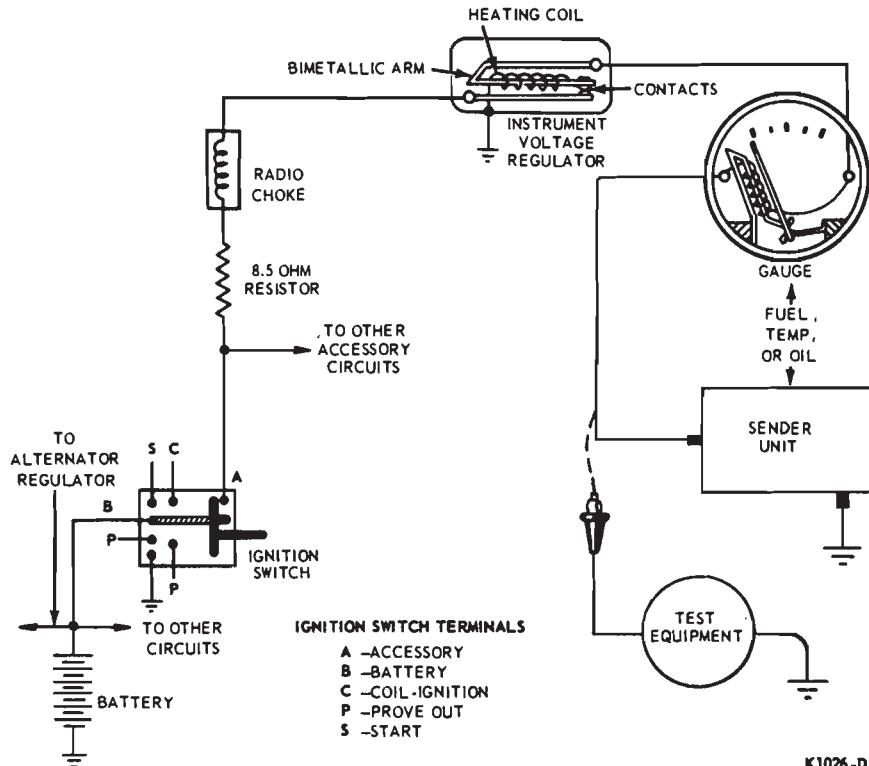


FIG. 1—Instrument Voltage Regulator and Gauge System Tests

scale) to the gauge lead that was disconnected from the sender unit (Fig. 1). Connect the other test lead to a suitable ground. With the ignition switch in the ON or ACC position, a flashing light or fluctuating voltage will indicate that the instrument voltage regulator is good and that the

gauge circuit is not interrupted.

If a pulsating voltage is shown but the gauge(s) are not accurate, perform the calibration test.

If the light stays on or the voltage reading is steady, replace the I.V.R.

If no voltage is indicated by the voltmeter or test light, check the

I.V.R. for proper ground and check for an open circuit in the I.V.R., the gauge windings or the printed circuit.

Do not ground or spark either terminal of the instrument voltage regulator. This will burn out the dash wiring harness or the instrument voltage regulator or both.

INSTRUMENT VOLTAGE REGULATOR—GAUGE CALIBRATION TEST

When the instrument voltage regulator or one of the gauges (oil, temperature, fuel) is suspected of being out of calibration, having a fluctuating movement or a high or low reading, both the gauge and the instrument voltage regulator must be tested simultaneously. This test is done on the vehicle.

The required test equipment con-

sists of a 10 ohm resistor to check the gauge calibration for correct high readings, and a 73 ohm resistor to check the calibration for low readings.

Disconnect the lead from the gauge to be tested at the appropriate sender unit, connect the resistor between the gauge lead and ground (Fig. 1), and turn on the ignition switch. With the 10 ohm resistor, the gauge should show a high reading. With the 73 ohm resistor, the gauge should show a low reading.

If the gauge does not perform as indicated, replace the instrument voltage regulator and retest to determine if the gauge is causing the trouble. If the gauge now reads correctly, the trouble has been eliminated. If the gauge is still out of calibration, the gauge is damaged and must be replaced.

GAUGE BENCH TEST FOR OPEN WINDINGS

To test a fuel, oil, or temperature gauge for open windings, remove the gauge from the vehicle as outlined in the appropriate car line Removal and Installation Section in this Part. Connect the gauge to an ohmmeter and read the resistance. An upward movement of the needle from 10 toward 14 ohms is normal because the current increases the temperature of the gauge coil (windings). If the ohmmeter reads below 10 ohms or above 14 ohms, replace the gauge.

INSTRUMENT VOLTAGE REGULATOR REMOVAL AND INSTALLATION

Follow the procedure given in the appropriate car line Removal and Installation section in this part.

2 FUEL INDICATING SYSTEM

DESCRIPTION AND OPERATION

The fuel indicating system consists of a sender unit located in the fuel tank and a fuel gauge mounted in the instrument cluster (Fig. 2).

The fuel gauge pointer is attached to a wire wound bi-metal strip and when heated by the flow of current controlled by the sender, produces the appropriate indication. When the current is low, there is little heating effect and the pointer moves a short distance. As the current increases, it produces a greater heating effect causing the pointer to move a proportionately greater distance.

The fuel level sending unit consists of a variable resistor, that is controlled by the action of an attached float in the fuel tank. When the fuel level is low, the sending unit resistance is high and restricts the flow of current to the fuel gauge. A high fuel level causes a low resistance in the sending unit and allows a higher current to flow to the fuel gauge.

Thus, if the fuel level is low, resistance in the sender is high and allows only a low current to flow through the gauge windings causing the pointer to move a short distance. If the fuel level is high, the resistance in the sender is low and allows a higher current to flow causing the pointer to

move a greater distance.

LOW FUEL LEVEL INDICATING SYSTEM

The low fuel level indicating system consists of the thermistor assembly attached to the fuel sender outlet tube (Fig. 3), located in the gas tank, the low-fuel relay, a 45-ohm ballast resistor in parallel with the relay coil, and the low-fuel light located on the instrument panel. The low-fuel light will glow just before the fuel gauge pointer indicates empty and/or when there are approximately four and one-half gallons of fuel in the tank.

A thermistor assembly (Fig. 3), attached to the fuel sender outlet tube, is kept cool when covered by gasoline. When the fuel level drops low enough to expose the thermistor to air, the thermistor heats up. The thermistor resistance then decreases and allows current to flow through the low-fuel signal relay. The relay contacts then close, to illuminate the low-fuel indicator light.

FUEL GAUGE AND FUEL SENDING UNIT TESTS

To test the fuel gauge, follow the instrument voltage regulator (I.V.R.) and fuel gauge tests given in Section 1

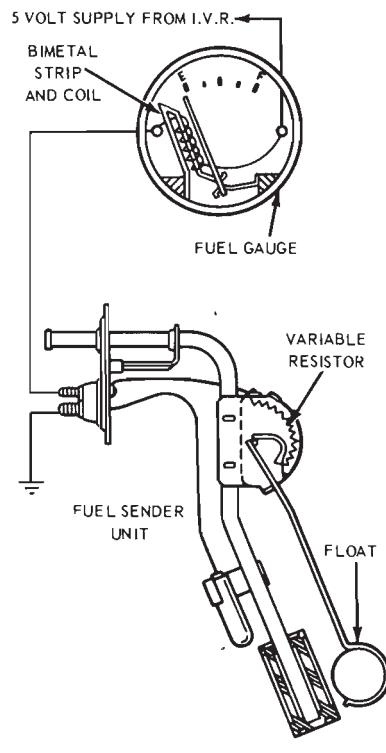


FIG. 2—Fuel Level Indicating System

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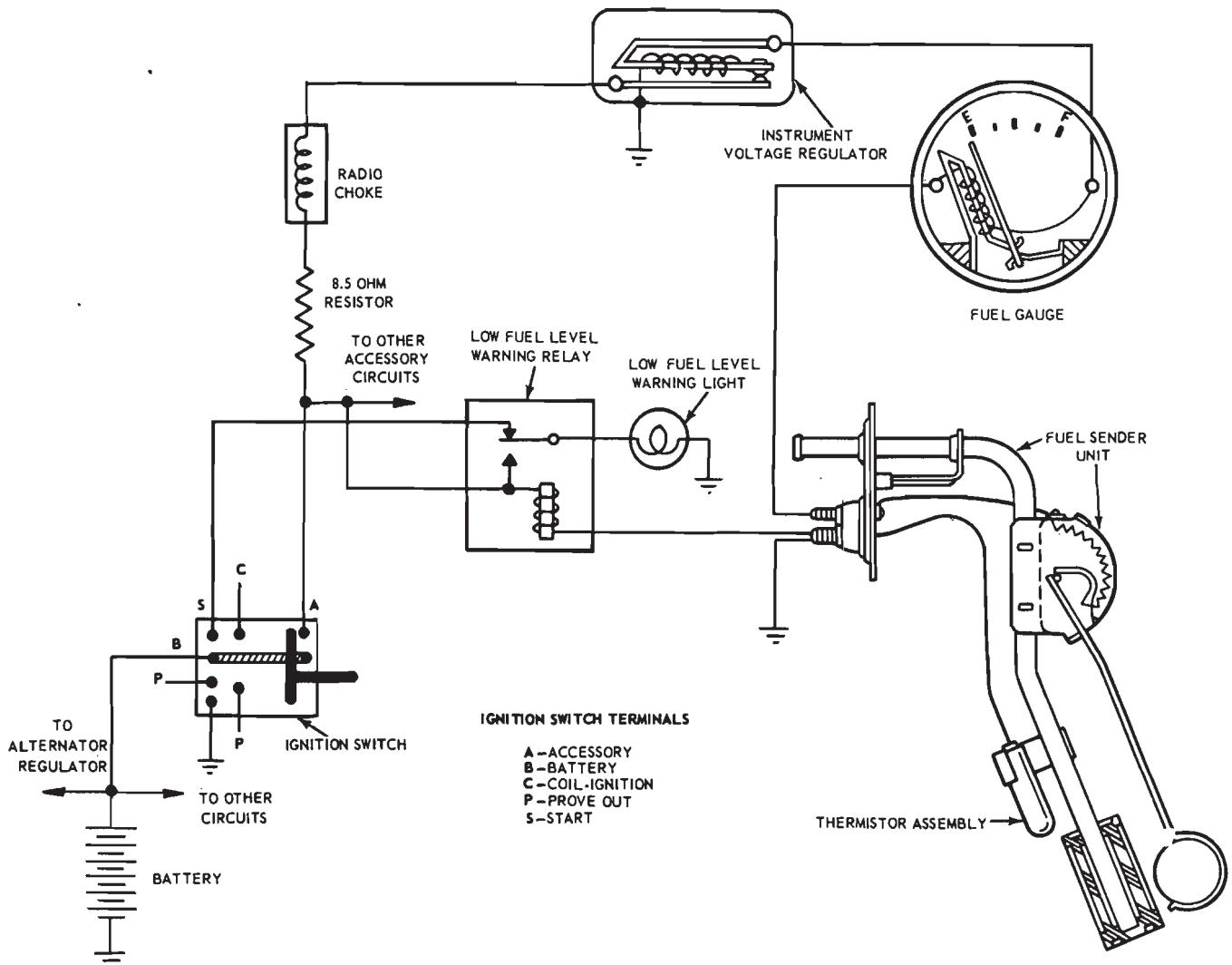


FIG. 3—Fuel Level Indicating and Low Fuel Warning System

K1477-D

of this Part.

There are two methods of testing the sending unit:

1. Drain or pump the fuel from the fuel tank. Disconnect the gauge lead at the sending unit and remove the sending unit from the tank. Using an ohmmeter, connect one lead to the metal housing of the sending unit and the other lead to the variable resistor terminal of the sending unit. The ohmmeter should read 8-12 ohms of resistance with the fuel sending unit float rod at the full end (up) of its travel and 60-86 ohms of resistance at the empty end (down). If the resistance is not within limits, replace the sending unit.

2. If the I.V.R./gauge calibration test (outlined in Section I) shows that both the I.V.R. and the gauge are operating properly, replacement of the

sending unit is indicated.

LOW FUEL LEVEL INDICATING SYSTEM TESTS

LOW FUEL WARNING LIGHT

To determine if the low fuel warning light is functional, the vehicle prove-out system may be used. With the ignition key turned to the START position the light should light (Fig. 3). If the light does not light, test the bulb and/or the power source lead.

LOW FUEL WARNING RELAY

To determine if the low fuel level warning relay is functional, disconnect the electrical plug at fuel sender. With the ignition switch in ON or ACC position, ground the wire lead

to the relay at the female plug (Fig. 3). The relay will close and the light will light. If the light is not lighted, after the light has been checked in START position, replace the relay.

LOW FUEL THERMISTOR

There are two methods for testing the low fuel thermistor:

1. With the fuel sending unit removed from the tank, but with the sender still attached to the wire harness, turn on the ignition switch and the low fuel indicator light should light. If the light does not light perform the low fuel warning relay test. If the relay is functioning properly, replace the fuel sender.

2. With the thermistor unit out of the fuel, use an ohmmeter with one lead connected to the metal housing

of the sending unit and the other lead connected to the thermistor terminal of the sending unit. The ohmmeter should read 450-600 ohms of resistance at room temperature. If the resistance is not within these limits, the fuel sender must be replaced.

FUEL SENDING UNIT REPLACEMENT

1. Remove the fuel from the fuel tank.
2. Disconnect the fuel gauge sending unit wire from the sending unit.

3. Loosen the hose clamp and disconnect the tank line at the sending unit.

4. Remove any dirt that has accumulated around the sending unit so that it will not enter the tank.

5. Turn the sending unit retaining ring counterclockwise and remove the unit, retaining ring, and mounting gasket.

6. Clean the fuel gauge sending unit mounting surface at the fuel tank.

7. Position the sending unit and a new mounting gasket on the fuel tank

and secure it with the retaining ring.

8. Connect the sending unit wire and the fuel tank line.

9. Fill the tank with the fuel removed.

10. Check the fuel gauge operation and check for leaks.

FUEL GAUGE REMOVAL AND INSTALLATION

Follow the procedure given in the appropriate car line Removal and Installation section in this part.

3 TEMPERATURE INDICATING SYSTEM

TEMPERATURE GAUGE—MUSTANG, COUGAR, FAIRLANE, MONTEGO CYCLONE, THUNDERBIRD, CONTINENTAL MARK III AND LINCOLN CONTINENTAL

DESCRIPTION AND OPERATION

The temperature gauge indicating system consists of a sending unit mounted in the cylinder head (6 cyl. vehicles) or intake manifold (8 cyl. vehicles) and a temperature gauge mounted on the instrument panel. When the engine temperature is low, the resistance of the sending unit is high, thus restricting the flow of current through the gauge which moves the pointer only a short distance. As the temperature of the engine increases, the resistance of the sending unit decreases causing a proportionately increased flow of current and movement of the pointer.

TEST

Start the engine and allow it to run until a thermometer placed in the coolant at the radiator filler cap reads a minimum of 180 degrees F. The gauge in the instrument panel should indicate within the normal band.

If the gauge does not indicate, perform the Instrument Voltage Regulator-Gauge Calibration Test as outlined in Section I of this Part. Replace the I.V.R. and/or gauge as indicated by the test. If the gauge still does not indicate, the wire leading to

the sending unit or the sending unit should be replaced.

TEMPERATURE GAUGE REMOVAL AND INSTALLATION

Follow the procedure given in the appropriate car line Removal and Installation section in this part.

TEMPERATURE INDICATOR LIGHT—FALCON, MAVERICK, MONTEGO, FORD, METEOR, AND MERCURY

DESCRIPTION AND OPERATION

The temperature indicating system provides the driver with an indication of engine coolant operating temperature by means of an indicator light. This system consists of a temperature switch unit mounted in the intake manifold (8 cylinder) or engine head (6 cylinder), lead wires and a temperature indicator light mounted in the instrument cluster.

The light is covered by a lens imprinted with the letters HOT. With the light off, the lens appears as a dark blank.

Should the temperature of the engine coolant reach approximately 245 degrees F, the HOT red indicator light will glow, indicating that the engine is overheated. The HOT red light does not indicate low coolant level.

This indicating light is controlled by the temperature switch (sending unit). The temperature switch has a

temperature-sensitive bimetallic arm which completes the circuit through the switch body to the engine ground. With the ignition switch in the START position, the HOT red light should glow even though the engine is cold, thus proving that the light bulb is operable. A set of contacts in the ignition switch (normally open) completes the proving circuit to ground in the start position.

TEST

During the test procedure, do not apply 12 volts directly to the temperature switch terminal at any time. This voltage will damage the temperature switch unit.

Perform the test only if the engine temperature is less than 245 degrees F. If the red light stays on with the ignition switch turned to the ON position, an inoperative temperature sending switch is indicated. Remove the connector from the temperature (sending unit) switch and connect an ohmmeter from the temperature switch terminal to the engine. There should be an open circuit (infinite ohms). If the meter reads zero ohms replace the switch (temperature sending unit). If the light is off when the ignition switch is in the ON position, turn the switch to the start position and the prove-out circuit should light the bulb. If the bulb does not glow, the bulb or the prove-out circuit is defective. Remove the bulb and check the bulb for continuity. If the ohmmeter indicates an open circuit (infinite ohms), replace the bulb and

again turn the ignition switch to the start position to light the bulb with the prove-out circuit. If the bulb still does not light, check the wire continuity from the temperature sending switch to the light bulb and then to the ignition switch. Repair any breaks in the circuit. This should complete the prove-out circuit so that the bulb will light when the ignition switch is again turned to the start position.

TEMPERATURE INDICATOR LIGHT REPLACEMENT

Refer to the cluster bulb replacement procedure given in the appropriate car line Removal and Installation section in this part.

TEMPERATURE SWITCH OR SENDING UNIT REMOVAL AND INSTALLATION—ALL VEHICLE LINES

The sending unit (temperature switch) used with the warning indicator light system is not interchangeable with the sending unit used with the gauge system. Refer to the Ford Car Master Parts Catalog and the Lincoln Mercury Parts and Accessories Catalog for proper parts usage.

Misuse of the sending units will result in inoperative temperature indicating systems and damaged sending units or gauges.

1. Disconnect the temperature sending unit wire from the sending unit.

2. Prepare the new temperature sending unit for installation by applying a small amount of conductive water resistant sealer C3AZ-19554-B, to the threads.

3. Remove the temperature sending unit from the intake manifold (8-cylinder vehicles) or the cylinder head (6 cylinder vehicles) and immediately install the new temperature sending unit.

4. Connect the wire to the temperature sending unit.

5. Start the engine and check the sending unit operation.

4 OIL PRESSURE INDICATING SYSTEM

OIL PRESSURE GAUGE—MUSTANG, COUGAR, XR7, MONTEGO CYCLONE, THUNDERBIRD, CONTINENTAL MARK III AND LINCOLN CONTINENTAL

DESCRIPTION AND OPERATION

The oil pressure gauge indicating system consists of the instrument voltage regulator, an oil pressure indicating gauge and an oil pressure sending unit, all connected in series. The sending unit consists of a diaphragm, a contact and a variable resistor. The oil pressure causes the diaphragm to move the contact on the variable resistor thus controlling the flow of current through the gauge.

When the oil pressure is low, the resistance of the sending unit is high, thus restricting the flow of current through the gauge which moves the pointer only a short distance. As the oil pressure increases, the resistance of the sending unit decreases causing a proportionately increased flow of current and movement of the pointer.

TEST

Remove the oil pressure sender unit and temporarily attach a mechanical oil pressure gauge in its place. Operate the engine to determine the oil pressure. If the oil pressure indicated on the mechanical gauge is normal,

the instrument cluster gauge should also indicate within the normal band.

If the gauge did not indicate, perform the Instrument Voltage Regulator-Gauge Calibration Test described in Section 1 of this part.

OIL PRESSURE GAUGE REMOVAL AND INSTALLATION

Follow the procedure given in the appropriate car line Removal and Installation section in this part.

OIL PRESSURE INDICATOR LIGHT—MUSTANG, COUGAR, FALCON, MAVERICK, FAIRLANE, MONTEGO, FORD, METEOR AND MERCURY

DESCRIPTION AND OPERATION

A red indicator light glows when the oil pressure is below a safe value. The light should come on when the ignition switch is first turned on, and it should go out when the engine comes up to speed. The light is connected between the oil pressure switch unit (mounted on the engine) and the coil terminal of the ignition switch (Fig. 4).

TEST

To test the indicator light, turn on the ignition switch. Do not start the

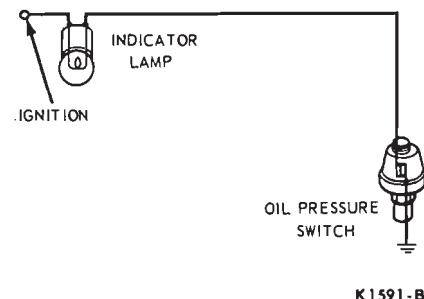


FIG. 4—Oil Pressure Indicator Light System

engine. The light should come on. Start the engine. The light should go out, indicating that the oil pressure has built up to a safe value.

To test the oil pressure switch on the engine, turn the ignition switch on with the engine not running. The indicator light should come on. If the indicator light does not come on, short the terminal of the oil pressure switch unit to ground. If the light now comes on, the oil pressure switch is inoperative, or not properly sealed to the engine. Be sure to use electrically conductive sealer C3AZ-19554-B on all oil pressure switches which do not have white tape on the mounting threads. If the light still does not come on, the bulb is burned out or the wires from the bulb to the ignition

switch and oil pressure switch are worn or broken.

OIL PRESSURE INDICATOR LIGHT REMOVAL AND INSTALLATION

Refer to the cluster bulb replacement procedure given in the appropriate car line Removal and Installation section in this part.

OIL PRESSURE SWITCH OR SENDING UNIT REMOVAL AND INSTALLATION—ALL VEHICLE LINES

The sending unit (pressure switch) used with the warning indicator light system is not interchangeable with the sending unit used with the gauge system. Refer to the Ford Car Master Parts Catalog and the Lincoln Mercury Parts and Accessories Catalog

for proper parts usage.

Misuse of the sending units will result in inoperative oil pressure indicating systems and damaged sending units or gauges.

To replace the unit, disconnect the wire from the terminal. Remove the unit from the engine. Apply conductive sealer C3AZ-19554-B to the threads of the new unit and install the unit. Connect the wire to the terminal and check the operation of the unit.

5 CHARGE INDICATING SYSTEM AND CLOCK

AMMETER—MUSTANG, COUGAR XR-7, MONTEGO CYCLONE, THUNDERBIRD, CONTINENTAL MARK III AND LINCOLN CONTINENTAL

DESCRIPTION AND OPERATION

This gauge is a shunt-type ammeter which senses the direction and rate of flow of electrical current to or from the battery to indicate whether the battery is being charged or discharged. The charge indicator is not adjustable, and should be replaced if found to be out of order.

TEST

To test the ammeter, turn the headlights on with the engine stopped. The meter pointer should move toward the D or discharge scale. If no movement of the needle is observed, check the rear of the meter housing to see if the wire connections are loose. If the connections are tight, and the meter does not indicate a discharge, the meter is inoperative. If the meter pointer moves toward the C or charge scale when the headlights are turned ON, the battery connections are reversed.

REMOVAL AND INSTALLATION

Follow the procedure given in the appropriate car line Removal and Installation section in this part.

CHARGE INDICATOR LIGHT—MUSTANG, COUGAR, FALCON, MAVERICK, FAIRLANE, MONTEGO, FORD, METEOR AND MERCURY

DESCRIPTION AND OPERATION

A red alternator charge indicator light is used. This light glows if the battery is discharging and the alternator is not supplying current.

When the ignition switch is closed, battery current flows through the charge indicator light and 15-ohm parallel resistor, and through the regulator voltage limiter contacts to the field, and the light comes on.

When the alternator builds up enough voltage to close the field relay contacts, full voltage is applied to the field and the charge indicator light goes out.

TEST

To test the charge indicator light,

turn the ignition switch on with the engine stopped. The light should come on. If it does not, the bulb is burned out, or the wiring to the light is broken.

REMOVAL AND INSTALLATION

Refer to the cluster bulb replacement procedure given in the appropriate car line Removal and Installation section in this part.

ELECTRIC CLOCK

ADJUSTMENT

Adjustment of the clock is automatic. If the clock runs slow or fast, merely reset the clock to the proper time. This action adjusts the clock automatically. Turning the knob clockwise, will cause the clock to run faster. Turning the knob counter-clockwise will cause the clock to run slower. The clock fuse is in the fuse panel (Group 36).

REMOVAL AND INSTALLATION

Follow the procedure given in the appropriate car line Removal and Installation section in this part.

6 SPEEDOMETER

DESCRIPTION AND OPERATION

The speedometer is connected to

the output shaft of the transmission by means of a flexible shaft (core), and a drive gear located inside the transmission. The core drives the

speedometer which registers speed in miles per hour and also drives an odometer which records distance traveled in miles and tenths of a mile.

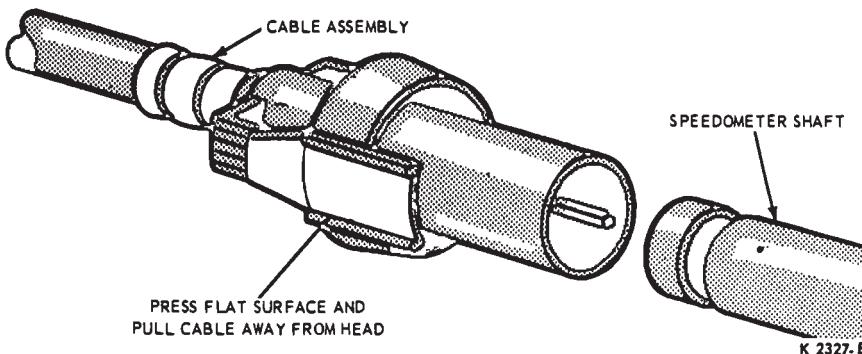


FIG. 5—Speedometer Cable-to-Speedometer Head Connection

The core or flexible shaft is housed in a flexible casing. The core and casing assembly is referred to as the speedometer cable.

TEST

To test the odometer accuracy, drive the car over a measured mile. Speedometer accuracy can be checked by comparing the speedometer in question against one known to be accurate, while two cars are moving at the same speed, or by timing the car on a measured mile. Refer to Speedometer calibration tolerance specifications, Section 17 in this part. The Ford Car Master Parts Catalog and the Lincoln Mercury Parts and Accessories Catalog show the proper speedometer gears to use for various rear axle and tire size combinations.

SPEEDOMETER REPAIR PROCEDURES

LOOSE CABLE ATTACHING NUTS—LINCOLN CONTINENTAL

1. Cable nuts should be tightened with pliers to approximately 18 to 25 in-lbs.
2. Cable nuts should start and run up freely by hand for at least three to four turns.
3. A loose cable nut can cause a bent cable core. Tightening will not always correct the problem.

DRAZZING CABLE CORE AND HEAD

Before removing a speedometer head, disconnect the cable at the head and insert a short section of cable core in the head. Rotate the section of core to check for any dragging or noise. The shaft in the speedometer head should turn freely and evenly.

If a new speedometer head is being installed, examine the square drive hole for sufficient lubricant. If lubricant is needed, apply a 3/16 inch diameter ball of C5AZ-19581-A lubricant in the drive hole.

DAMAGED CABLE CORE AND CASING

1. To check for a kinked cable core, remove and wipe dry. Lay the core out straight on a flat surface and roll it back and forth. Any kinks or damage will be seen. Then take an end in each hand, allowing the core to hang in approximately a 9 to 12 inch loop. Rotate both ends to be sure that the core turns evenly.

2. Routing of the cable casing is particularly important where the cable leaves the speedometer head. The optimum routing would provide that the cable and housing take virtually no change of direction for at least a length of 8 inches from the speedometer head.

3. When installing a new cable (core and casing) it is necessary that extra care be taken to see that the new assembly is guided and routed properly to eliminate any kinks.

4. Proper lubrication of the cable core is accomplished by a light application of B5AZ-19581-A lubricant after the cable has been wiped clean. A light film is all that is required.

DAMAGED DRIVE AND DRIVEN GEARS

1. A scored, nicked or gouged driven gear is usually indicative of a damaged drive gear on those vehicles that have the drive gear integral with the transmission output shaft. The output shaft should be carefully inspected for imperfections and replaced if necessary.

2. A driven gear with two or three

adjoining teeth badly scored is indicative of improper assembly procedure. The gear should be inserted in the transmission while simultaneously turning the drive shaft. This will insure initial gear engagement and prevent gear damage. Force should never be used.

3. Whenever a drive gear is replaced, a new driven gear should also be installed, regardless of its apparent condition.

SPEEDOMETER HEAD REMOVAL AND INSTALLATION

Follow the procedure given in the appropriate car line Removal and Installation section in this part.

SPEEDOMETER CABLE TO SPEEDOMETER HEAD CONNECTION—EXCEPT LINCOLN CONTINENTAL

To disengage the cable from the speedometer head, press on the flat surface of the plastic connector (quick-connect) and, at the same time, pull the cable assembly away from the head (Fig. 5).

To connect the cable to the head, align the quick-connect with the grove collar at the speedometer head and push the connector on the collar with a twisting motion until the catch is engaged.

Access to the connection point varies with the car line as described in the following paragraphs:

FORD AND METEOR

Remove the upper section of the instrument panel pad as outlined in Group 47. Reach down and disconnect the cable from behind the instrument panel.

MERCURY

Remove the instrument panel pad as described in Group 47, and remove the left defroster nozzle. Reach through the opening above the instrument cluster and, with the left hand, depress the quick-connect while pulling back on the cable with the right hand.

MUSTANG AND COUGAR

Remove the instrument cluster as described in Section 9 of this part, and disconnect the cable from the back side of the cluster.

FALCON, FAIRLANE AND MONTEGO

Reach under the instrument panel and release the quick-connect.

THUNDERBIRD AND CONTINENTAL MARK III

Remove the speedometer as described in Section 15 (Thunderbird) or 16 (Continental Mark III). Through the speedometer opening in the cluster, remove the speedometer housing retainer screws, clamps and plastic retaining collar from the cluster housing. Release the quick-connect and pull the cable away.

SPEEDOMETER CABLE TO SPEEDOMETER HEAD CONNECTION—LINCOLN CONTINENTAL

To gain access to the connection point, remove the radio as described in Group 35. Unscrew the threaded cable connector from the speedometer head.

SPEEDOMETER CORE REPLACEMENT—ALL MODELS

REMOVAL

1. Disconnect the speedometer cable (core and casing assembly) from the speedometer head as outlined in the foregoing paragraphs.

2. Pull the speedometer core out of the upper end of the casing.

3. If the core is broken, raise the vehicle on a hoist and remove the bolt retaining the speedometer cable mounting clip to the transmission.

4. Remove the shaft and driven gear from the transmission (Fig. 6). Remove the driven gear retainer, and remove the driven gear and shaft from the cable.

5. Remove the lower part of the core (if it is broken) from the lower end of the casing.

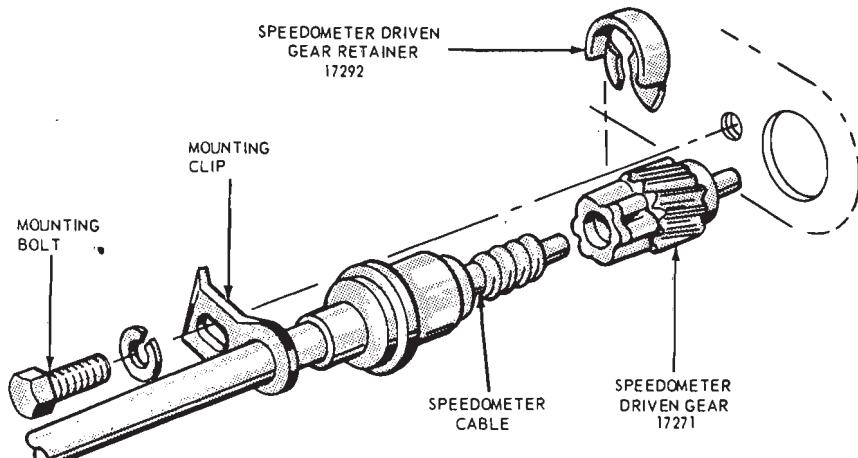


FIG. 6—Speedometer Driven Gear Retainer and Mounting at Transmission

INSTALLATION

1. Position the driven gear to the casing and install the gear retainer. Install the driven gear and casing in the transmission, and install the retaining bolt. Lower the vehicle.

2. Using the old core, carefully determine the exact length of the core. Subtract 9/16 of an inch from the length.

3. Cut the new core to the proper length and remove any burrs or frayed edges. Be certain not to cut from the squared end of the core.

4. Install the tip on the core, making certain to seat the core in the bottom of the tip.

5. Place the core and tip in a crimping die, and place the die on a solid surface and strike it squarely with a hammer to crimp it.

6. Remove the crimping die.

7. Lubricate the core with cable lubricant C5AZ-19581-A (do not over lubricate). Install the core (square end first) into the upper end of the casing and push it all the way through to the transmission. When the cable is nearly seated, twist it slightly to make

sure that the squared end is engaged in the speedometer driven gear at the transmission.

8. Connect the cable assembly to the speedometer, being sure to eliminate any kinks in the housing and shaft. Check the operation of the speedometer.

SPEEDOMETER CABLE REPLACEMENT—ALL MODELS

Disconnect the speedometer cable from the speedometer head as outlined in this section and push the cable and grommet through the opening in the floor pan or dash panel. Raise the car on a hoist and disengage the cable from all retaining clips. Disconnect the cable from the transmission and connect the new cable to the transmission as described in the foregoing procedure. Engage the new cable in the retaining clips and route it through the opening in the floor pan or dash panel. Push the grommet in place. Lower the vehicle and connect the cable to the speedometer head as outlined in this section.

7 FORD AND METEOR—REMOVAL AND INSTALLATION

INSTRUMENT CLUSTER

In order to remove the cluster, the instrument panel pad has to be removed for access to the disconnect points behind the cluster. Refer to

Group 47, Part 03 for pad removal. Disconnect the battery ground cable. From behind the cluster, disconnect the plugs to the printed circuit, radio, heater and A/C fan, windshield wiper/washer, and any other electrical connection to the cluster (Fig. 7). Disconnect also the heater and A/C control cables, and the speedometer cable. Remove the power antenna rear support (1 bolt).

For access to the cluster mounting

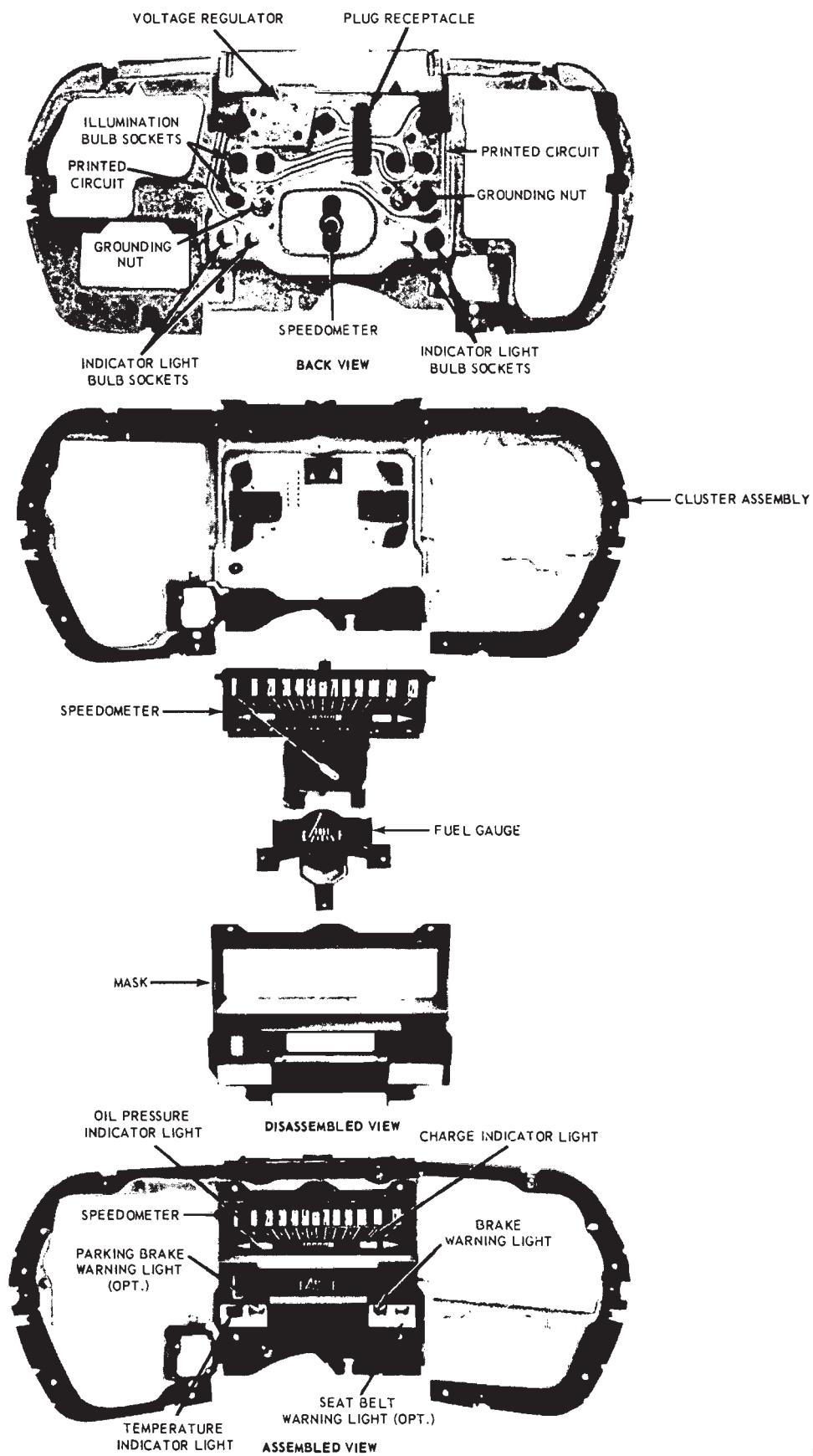


FIG. 7—Ford and Meteor Instrument Cluster

screws remove the lighter element and all the control knobs from the passenger side of the cluster. Remove the cluster trim cover (ten attaching screws) (Fig. 7).

Remove the eight mounting screws and withdraw the cluster from the instrument panel.

PRINTED CIRCUIT

To replace the printed circuit, the cluster must first be removed as described in the foregoing.

From the back side of the cluster, remove the eleven bulbs by turning counterclockwise (Fig. 7).

Disconnect (snap off) the printed circuit connector buttons from the instrument voltage regulator and remove the regulator (one retaining nut). Remove the nuts and screw which also retain the printed circuit to the cluster, and remove the printed circuit.

INSTRUMENT VOLTAGE REGULATOR AND/OR BULBS FOR CLUSTER ILLUMINATION AND INDICATOR LIGHTS

Only the upper section of the in-

strument panel pad has to be removed for access to these parts (Refer to Group 47, Part 03).

Disconnect the battery ground cable. From behind the cluster, disconnect (snap off) the printed circuit connector buttons from the instrument voltage regulator and remove the regulator (one retaining nut) (Fig. 7).

Remove the bulb(s) by turning counterclockwise.

FUEL GAUGE AND SPEEDOMETER

Disconnect the battery ground cable. From the passenger side of the instrument panel, remove the lighter element and all of the control knobs (Fig. 7), and then remove the cluster trim cover (ten attaching screws).

Remove the attaching screws and lift the lens and mask assembly from the speedometer and fuel gauge.

Remove the spring washers and nuts (one at each side), the attaching screw at the bottom, and then remove the fuel gauge from the studs (Fig. 7).

Remove the instrument panel pad for access to the speedometer quick-

connect. Reach behind the cluster from the top. To disengage the cable from the speedometer, press on the flat surface of the quick-connect and, at the same time, pull the cable away from the head. Remove the attaching screws and pull the speedometer head out of the cluster.

CLOCK

Disconnect the battery. Remove the instrument panel pad for access to the wiring behind the clock. From the passenger side of the instrument panel, remove the lighter element and all of the control knobs (Fig. 7), and then remove the cluster trim cover (ten attaching screws).

The seat belt, low fuel, door ajar, and lights-on warning lights, if so equipped, are located on the clock dial face. All of these bulbs as well as two illumination bulbs and the clock lead wire have to be disconnected from behind the instrument panel.

After making the electrical disconnections, the clock can now be removed by removing the three retaining screws at the front of the clock.

8 MERCURY—REMOVAL AND INSTALLATION

INSTRUMENT CLUSTER

1. Disconnect the battery ground cable. Remove the windshield wiper knob and bezel, the cigar lighter element and the finish panel so that the instrument panel pad can be removed (See Group 47, Part 03).

2. Remove the windshield wiper nut and then, the bracket (three attaching screws) from the left end of the pad support.

3. Remove the cigar lighter socket and bracket assembly (two attaching screws) from the right end of the pad support.

4. Remove five pad support-to-instrument panel screws and three lower L.H. panel-to-instrument panel screws, and then remove the pad support and lower panel as an assembly.

5. From behind the instrument cluster, disconnect the connector plug to the printed circuit, the clock connection and any other electrical connection. Also, disconnect the speed-

ometer cable by pressing on the flat surface of the plastic connector and pulling the cable away from the speedometer head.

6. Remove the cluster assembly from the instrument panel (six attaching screws).

PRINTED CIRCUIT

To replace the printed circuit, the cluster must first be removed as described in the foregoing procedure.

From the back side of the cluster, remove the 13 bulbs by turning them counterclockwise (Fig. 8).

Disconnect (snap off) the printed circuit connector buttons from the instrument voltage regulator and remove the regulator (one retaining screw). Remove the plastic insulator and the nuts which retain the printed circuit to the cluster and remove the printed circuit.

INSTRUMENT VOLTAGE REGULATOR AND/OR BULBS FOR CLUSTER ILLUMINATION AND INDICATOR LIGHTS

For access, remove the instrument panel pad, the pad support and the lower L.H. panel from the instrument panel as described in steps 1 through 4 under Instrument Cluster. The regulator and bulbs can now be reached from under the lower forward edge of the cluster.

At the left end of the cluster, disconnect (snap off) the printed circuit connector buttons from the voltage regulator and remove the regulator (one retaining screw) (Fig. 8).

Remove the bulb(s) by turning counterclockwise.

FUEL GAUGE, SPEEDOMETER, CLOCK

The clock is removed by removing the retaining screws at the back of the

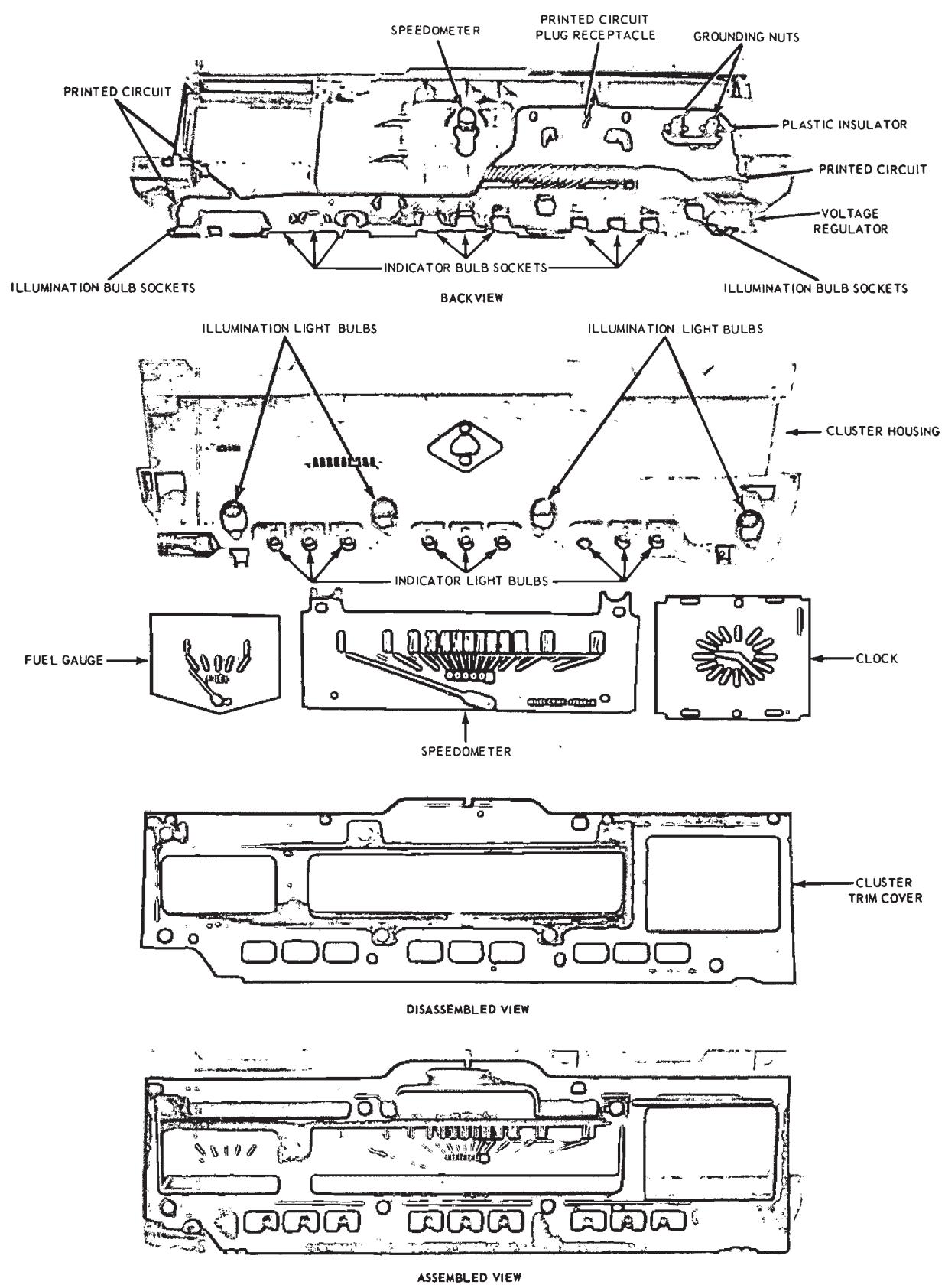


FIG. 8—Mercury Instrument Cluster

cluster housing.

Remove the cluster assembly from the instrument panel and remove the

mask and lens assembly from the cluster (Fig. 8).

Remove the speedometer and fuel

gauge by removing the retaining screws and nuts at the rear of the cluster housing.

9 MUSTANG AND COUGAR—REMOVAL AND INSTALLATION

INSTRUMENT CLUSTER

After disconnecting the battery, remove the instrument panel pad for access to the cluster mounting screws. Refer to Group 47, Part 03 for pad removal. Remove the screws retaining the cluster to the instrument panel and withdraw the cluster slightly. Disconnect the multiple plug to the printed circuit and, if so equipped, the tachometer plug. Disconnect the speedometer cable by pressing on the flat surface of the plastic connector and pulling the cable away from the speedometer head. The instrument cluster can now be removed from the instrument panel.

INSTRUMENT VOLTAGE REGULATOR AND/OR CLUSTER PRINTED CIRCUIT AND CLUSTER ILLUMINATION

Since these units are replaced from the back side of the cluster, remove the cluster first as described in the foregoing procedure.

To remove the instrument voltage regulator, disconnect (snap off) the printed circuit connector buttons from the regulator. The regulator can now be removed from the cluster by removing one retaining screw (Figs. 9 and 10).

If the printed circuit is to be replaced, continue with the following steps in addition to removing the instrument voltage regulator. Remove the indicator and illumination bulbs from the back side of the cluster by turning them counterclockwise. Remove the nuts and screws retaining the printed circuit to the cluster, and lift off the printed circuit.

INSTRUMENTS—MUSTANG

The instrument cluster has four pods and is available in two different pod arrangements. The two pod arrangements are numbered from left to right in the cluster as follows:

Pod Arrangement No.1

1. Charge Indicator Gauge (Ammeter)
2. Speedometer
3. Fuel and Temperature Gauge Assembly (Brake and Seat Belt indicator lights)
4. Oil Pressure Gauge

Pod Arrangement No.2

1. Temperature Gauge
2. Speedometer
3. Tachometer (with oil pressure, Brake System and charge indicator lights)
4. Fuel Gauge

Before attempting to replace the instruments, first remove the cluster from the panel as described in this section.

TWO CENTER PODS—SPEEDOMETER AND FUEL-TEMP GAUGE ASSEMBLY OR TACHOMETER

Separate the ends of the printed circuit from the left and right instrument rear housings by removing the three bulbs and two gauge retaining nuts at each housing (Fig. 9). Remove the center instrument rear housing from the cluster (six retaining screws). The printed circuit remains attached to the center housing. From the opposite side of the housing remove the speedometer (two retaining screws). Remove the fuel-temperature gauge assembly (if so equipped) from the housing (four attaching nuts); or remove the two attaching nuts and the tachometer if so equipped.

LEFT POD—AMMETER OR TEMPERATURE GAUGE RIGHT POD—OIL PRESSURE GAUGE OR FUEL GAUGE

Disconnect the end of the printed circuit from the applicable (left or right) instrument rear housing by removing the three bulbs and two re-

taining nuts.

Fold the printed circuit out of the way and remove the housing from the cluster (two retaining screws). Remove the now loose mask and lens which had been trapped between the trim cover and gauge housing. Remove the insulator from the gauge studs and remove the gauge.

CLOCKS

Two styles of clock are used on the Mustang depending upon model. Both styles are mounted to the rear of the instrument panel at the right end. Models 63A, 65A, 65C, and 76A are retained by four screws. On all other Mustang models three retaining screws are used.

Both clocks are removed in the same way. From behind the instrument panel, disengage the two light bulb sockets from the clock and disconnect the electrical plugs. Remove the retaining screws and lower the clock from behind the instrument panel.

INSTRUMENTS—COUGAR

Before attempting to replace the instruments, first remove the cluster from the panel as described in this section.

To replace any Cougar instrument, remove the mask and lens from the front of the cluster assembly and separate the cluster front and rear housings assemblies (Figs. 10 and 11).

SPEEDOMETER AND TACHOMETER—TWO CENTER PODS

Remove the speedometer from the cluster rear housing (two retaining screws). Remove the tachometer from the cluster rear housing assembly (three retaining nuts).

GAUGES IN RIGHT AND LEFT PODS—TEMPERATURE, OIL PRESSURE

Remove the two nuts and washers

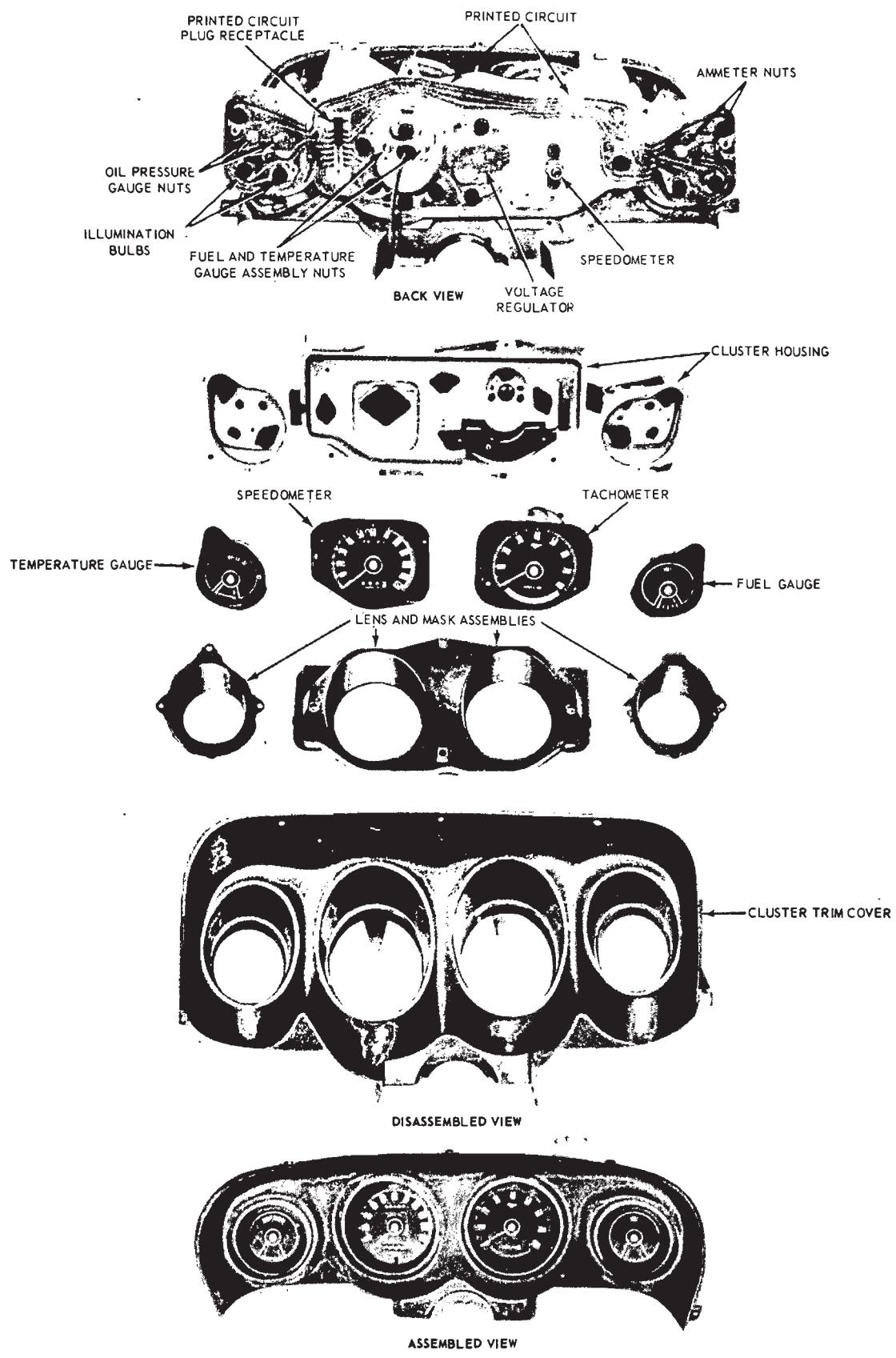


FIG. 9—Mustang Instrument Cluster

K 2106-B

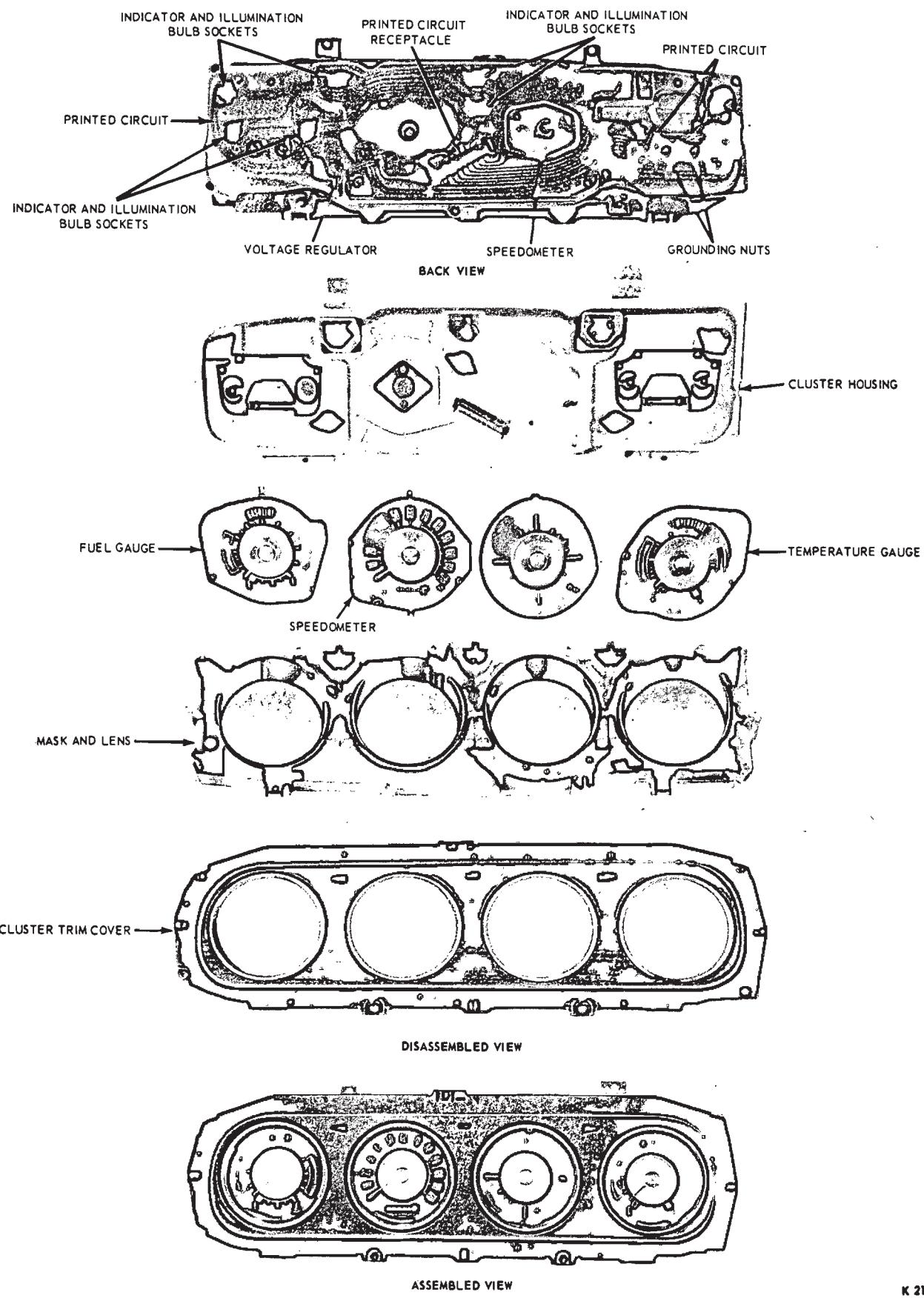
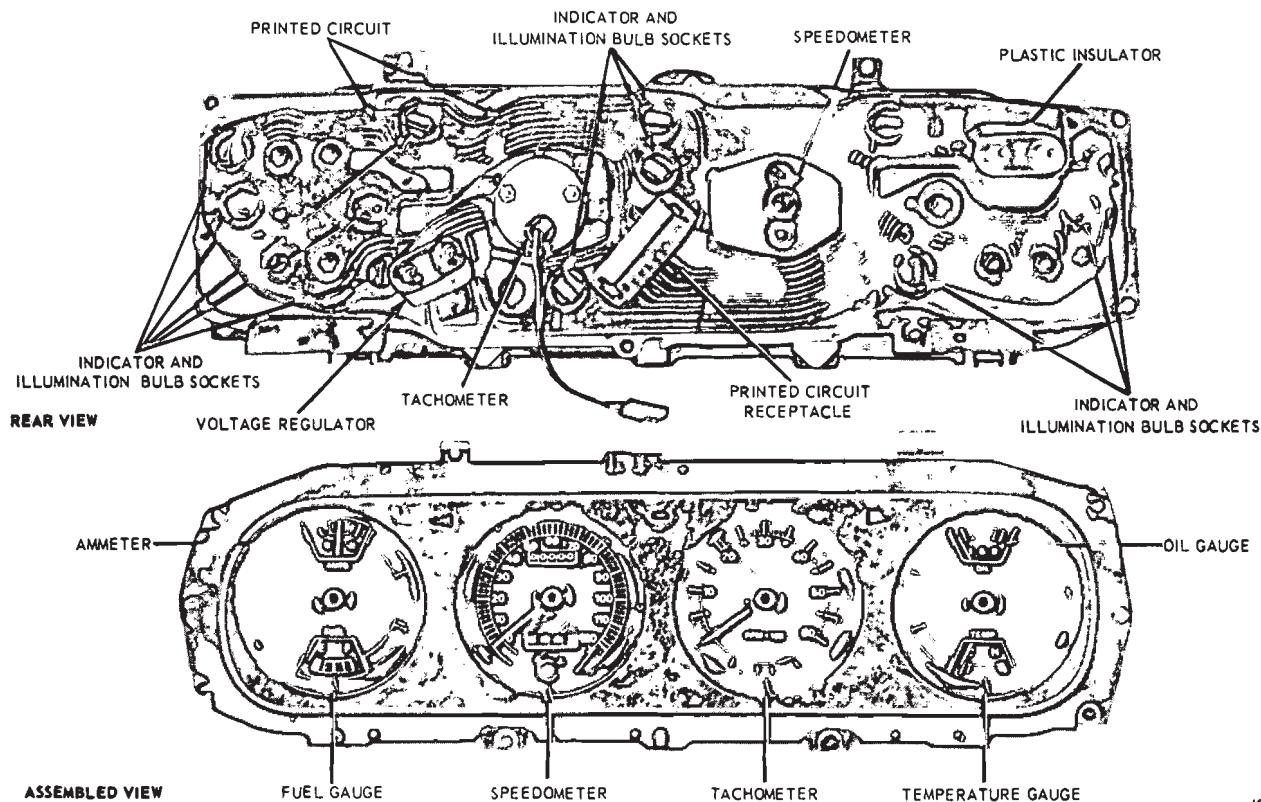


FIG. 10—Cougar Instrument Cluster

K 2185-B



K 1094-C

FIG. 11—Cougar XR7 Instrument Cluster

from the gauge studs at the back of the cluster rear housing. Remove the face plate at the front of the cluster rear housing (two screws) and remove the gauge from the housing.

CLOCK

The clock can be removed by disengaging the clock light bulb sockets

from the back of the clock behind the instrument panel, pulling the connector plug and removing the clock attaching screws.

10 FALCON—REMOVAL AND INSTALLATION

INSTRUMENT CLUSTER

REMOVAL

1. Disconnect the battery ground (negative) cable.
2. Remove the instrument panel pad (Refer to Group 47, Part 03).
3. Remove the five screws retaining the instrument cluster to the instrument panel and position the cluster out.
4. Disconnect the speedometer cable and the heater control cables and heater illumination bulb. Also disconnect the heater switch plug and the multiple plug to the printed circuit. Remove the clamp retaining the heater cables to the control and remove the cluster.

INSTALLATION

1. Connect the heater control cables to the control, and install the retaining clamp. Connect the speedometer cable and the heater control illumination bulb. Plug in the printed circuit multiple plug and heater switch plug.
2. Position the cluster to the instrument panel and install the five retaining screws.
3. Install the instrument panel pad.
4. Connect the battery ground (negative) cable, and check the operation of the instrument cluster.

CLUSTER ILLUMINATION AND INDICATOR BULBS, INSTRUMENT VOLTAGE REGULATOR AND

PRINTED CIRCUIT

1. Remove the cluster from the instrument panel as described in the foregoing procedure.
2. Remove the cluster illumination and indicator bulbs from the back of the cluster. Remove the three screws retaining the instrument voltage regulator and lead wires (Fig. 12). Remove the two retaining nuts from the fuel gauge and the three screws retaining the printed circuit and remove the printed circuit.
3. Position the new printed circuit to the back of the cluster and install the three retaining screws. Install the two retaining nuts on the fuel gauge. Position the voltage regulator to the cluster and install the three retaining screws to the regulator and lead

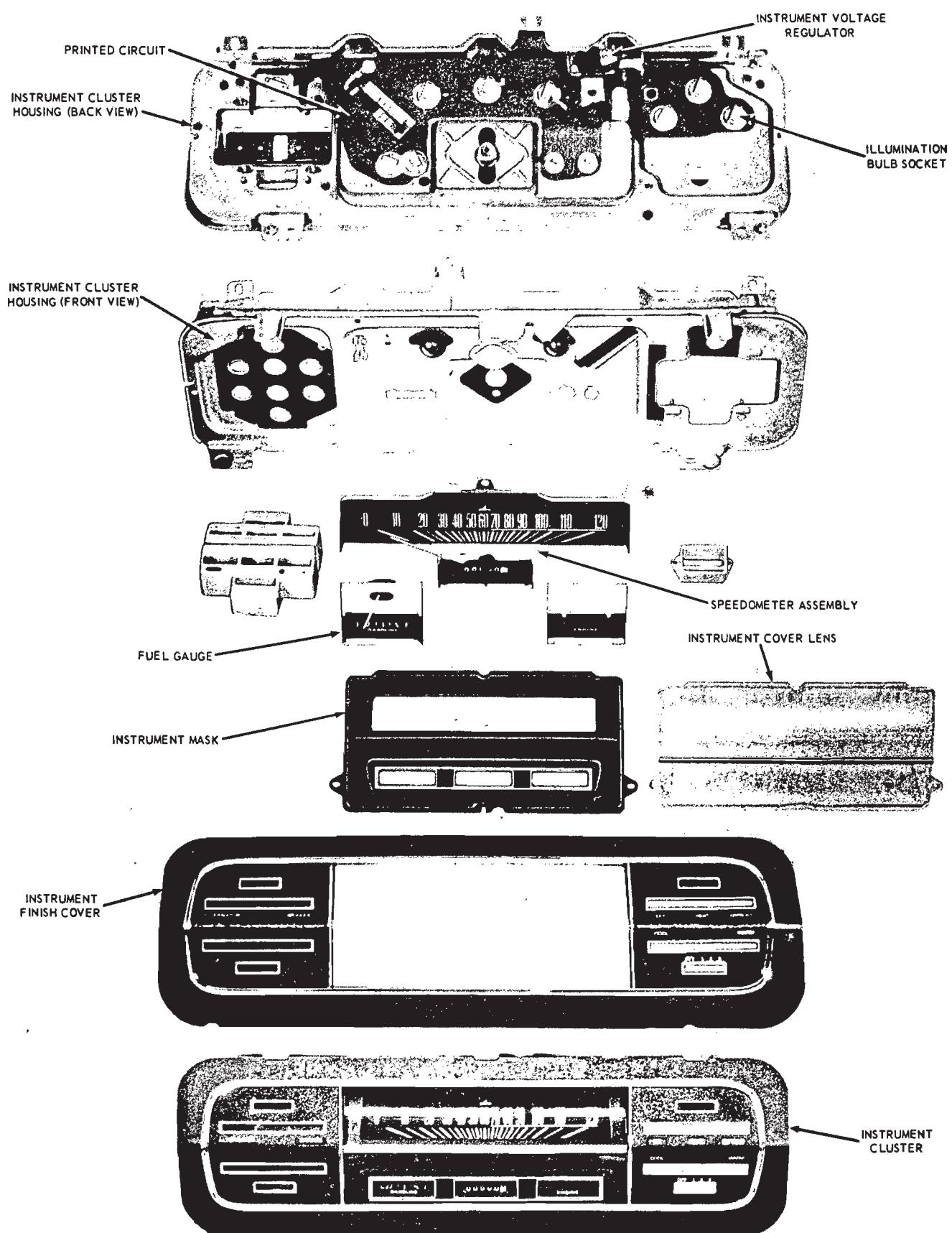


FIG. 12—Falcon Instrument Cluster

K2181-A

wires. Also install the cluster illumination and indicator bulbs.

4. Install the cluster in the instrument panel as described in the foregoing procedure.

SPEEDOMETER AND FUEL GAUGE

1. Remove the cluster from the instrument panel as described in this section.

2. Remove the heater control knobs and remove the eight screws retaining the instrument cluster rear housing and remove the housing (Fig. 12).

3. Remove the three screws retaining the speedometer to the housing and remove the speedometer assembly.

4. Remove the two nuts retaining

the fuel gauge to the cluster housing and remove the gauge.

5. Position the replacement fuel gauge to the cluster housing and install the two retaining nuts.

6. Position the replacement speedometer to the cluster housing and install the retaining screws.

7. Position the cluster rear housing to the cluster and install the eight retaining screws. Also install the heater control knobs.

8. Install the cluster in the instrument panel as described in this section.

ELECTRIC CLOCK

1. Disconnect the battery ground cable from the battery.

2. From underneath the instrument panel, disconnect the clock wire connectors (blue and blue-red wires).

3. Remove the nut and washer with spacer assembly which retains the clock.

4. Pull the clock wires through the instrument panel and remove the clock.

5. Position the replacement clock to the instrument panel and route the clock wires through the instrument panel.

6. Install the spacer, nut and washer assembly which retains the clock to the instrument panel.

7. Connect the clock wiring connectors.

8. Connect the battery ground cable to the battery.

11 MAVERICK—REMOVAL AND INSTALLATION

INSTRUMENT CLUSTER AND CLUSTER BULBS

Disconnect the battery.

From under the instrument panel, disconnect the speedometer cable by pressing on the flat surface of the plastic connector (quick connect) and pulling the cable away from the head. Remove the two retaining screws at the top of the cluster, and swing the cluster down from the panel (Fig. 13).

If only bulb replacement is required, remove the affected bulb(s) at this point by turning counterclockwise (Back View, Fig. 14). Install the new bulb(s) and swing the cluster back into position.

If the instrument cluster is being removed, proceed further by disconnecting the multiple connector plug from the printed circuit at the back of the cluster. The cluster can now be removed from the instrument panel by disengaging the brackets on the cluster lower edge from the slots in the panel.

When installing the cluster, be sure that the cluster is properly located with the brackets locked in place.

INSTRUMENT VOLTAGE REGULATOR AND/OR CLUSTER PRINTED CIRCUIT

Since these units are replaced from the back side of the cluster, remove the cluster first as described in the foregoing procedure.

To remove the instrument voltage regulator, carefully disconnect (snap off) the printed circuit connector buttons from the regulator. The regulator can now be removed from the cluster by removing one retaining screw (Fig. 14).

If the printed circuit is to be replaced, continue with the following steps in addition to removing the instrument voltage regulator. Remove the indicator and illumination bulbs from the back side of the cluster by turning them counterclockwise. Remove the nuts retaining the printed circuit to the fuel gauge, and lift off the printed circuit.

MASK, LENS SPEEDOMETER AND FUEL GAUGE

Remove the cluster from the instrument panel as described under Instrument Cluster and Cluster Bulbs.

From the rear side of the cluster, remove the four retaining screws, and separate the cluster housing from the finish panel (Fig. 14). Note that the two lower screws also retain the metal brackets that engage the slot in the instrument panel.

If the mask and/or lens are to be replaced, they can now be removed from the cluster finish panel.

The speedometer can be removed from the front side of the cluster housing by removing two retaining screws from the rear.

To remove the fuel gauge and indicator light assembly, remove three retaining screws from the front side of the cluster housing and two retaining nuts from the rear side. Withdraw the assembly from the front side of the housing.

After installing the new speedometer and/or fuel gauge assembly in the cluster housing, position (in the following order) the lens, mask, and cluster housing to the inner side of the cluster finish panel. Position the two brackets to the rear side of the cluster housing at the lower screw holes, and secure all of these parts together with the four retaining screws (Fig. 14).

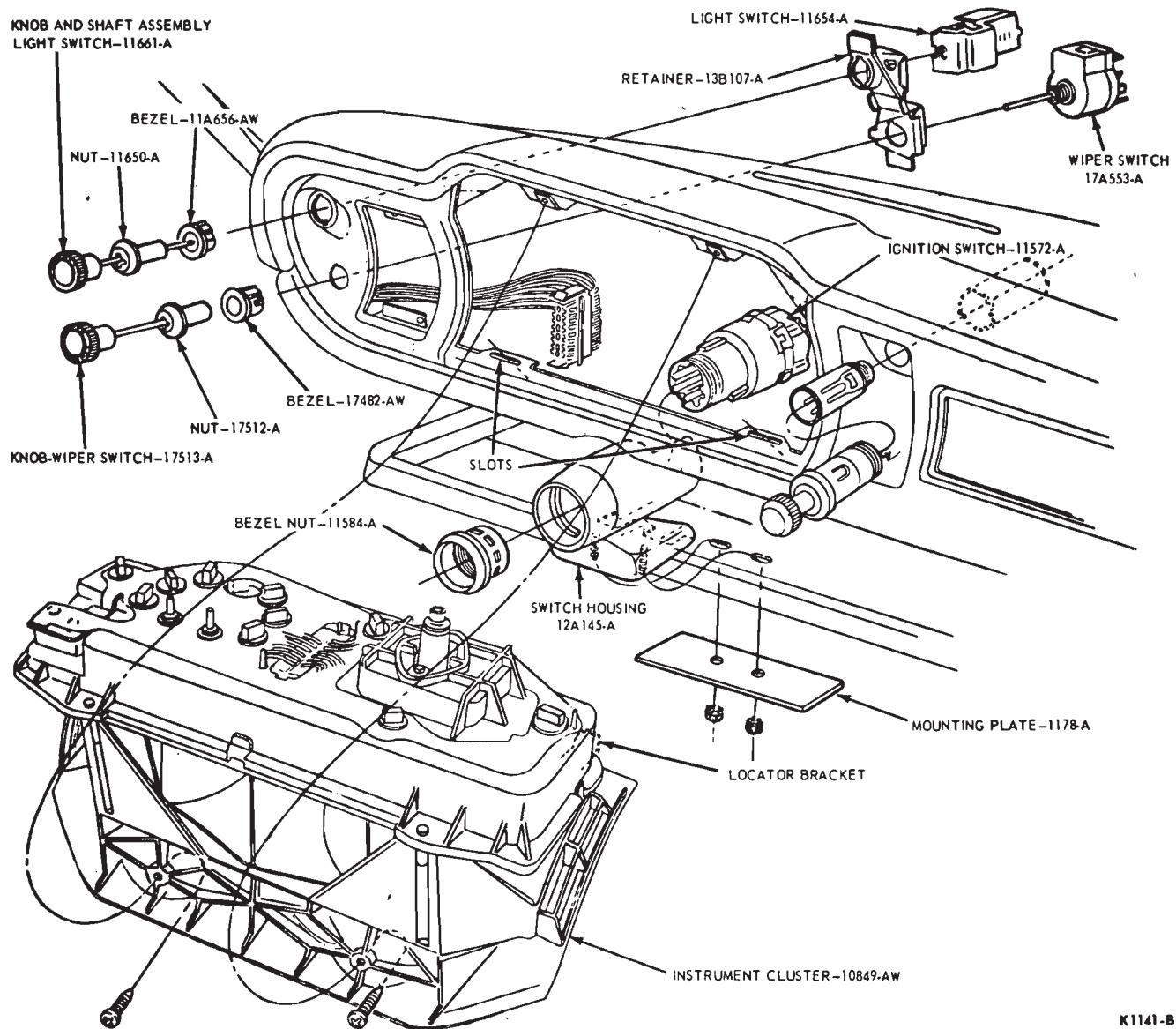


FIG. 13—Cluster and Switch Installation

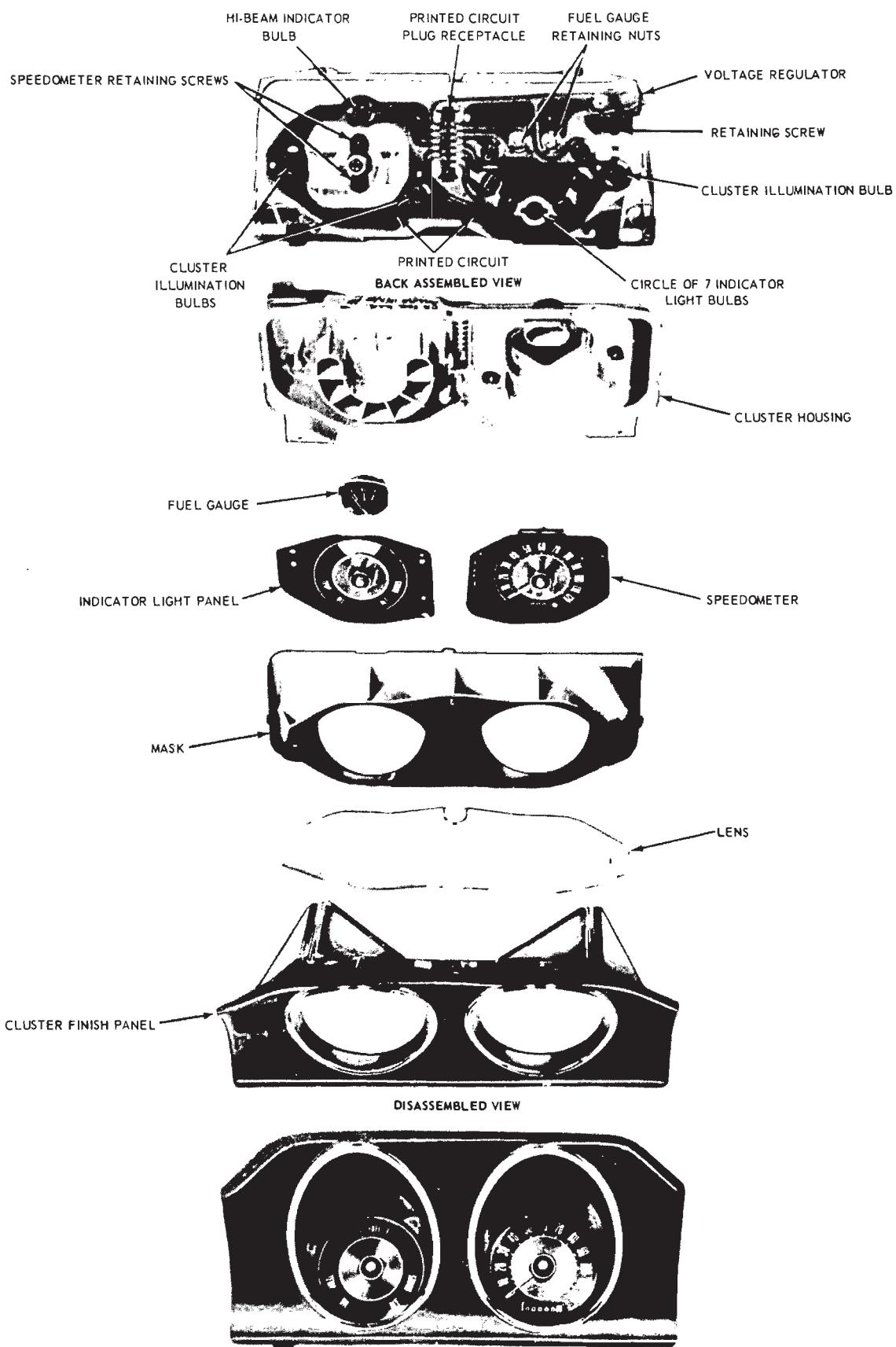


FIG. 14—Maverick Instrument Cluster

FRONT ASSEMBLED VIEW

K1159-C

12 FAIRLANE—REMOVAL AND INSTALLATION

INSTRUMENT VOLTAGE REGULATOR, CLUSTER ILLUMINATION AND INDICATOR BULBS

To gain access to any of these parts, remove the instrument panel pad as given in Part 47-03. Removal of the pad provides an opening at the top through which these parts can be reached at the back side of the cluster.

To replace the instrument voltage regulator, disconnect (snap off) the printed circuit connector buttons from the regulator, remove the retaining screw and lift out the regulator (Fig.

15).

To replace any one of the printed circuit-connected bulbs, turn the bulb and socket assembly 1/4 turn counterclockwise and remove. Position the new bulb and socket assembly to the printed circuit and turn clockwise.

To replace one of the three wiring harness-connected bulbs (Lights On, Parking Brake, Seat Belts), disengage the bulb and socket assembly from the cluster by turning counterclockwise. Remove the old bulb from the socket and install a new one. Position the bulb and socket assembly in the receptacle and turn clockwise.

INSTRUMENT CLUSTER

REMOVAL

1. Disconnect the battery ground cable.
2. Remove the instrument panel pad as described in Part 47-03.
3. From the front of the cluster, remove the four screws that retain the cluster to the instrument panel, and position the cluster part way out of the panel.
4. Disconnect the speedometer cable, the multiple plug to the printed circuit, and the feed plug to either the clock or tachometer (if so equipped).

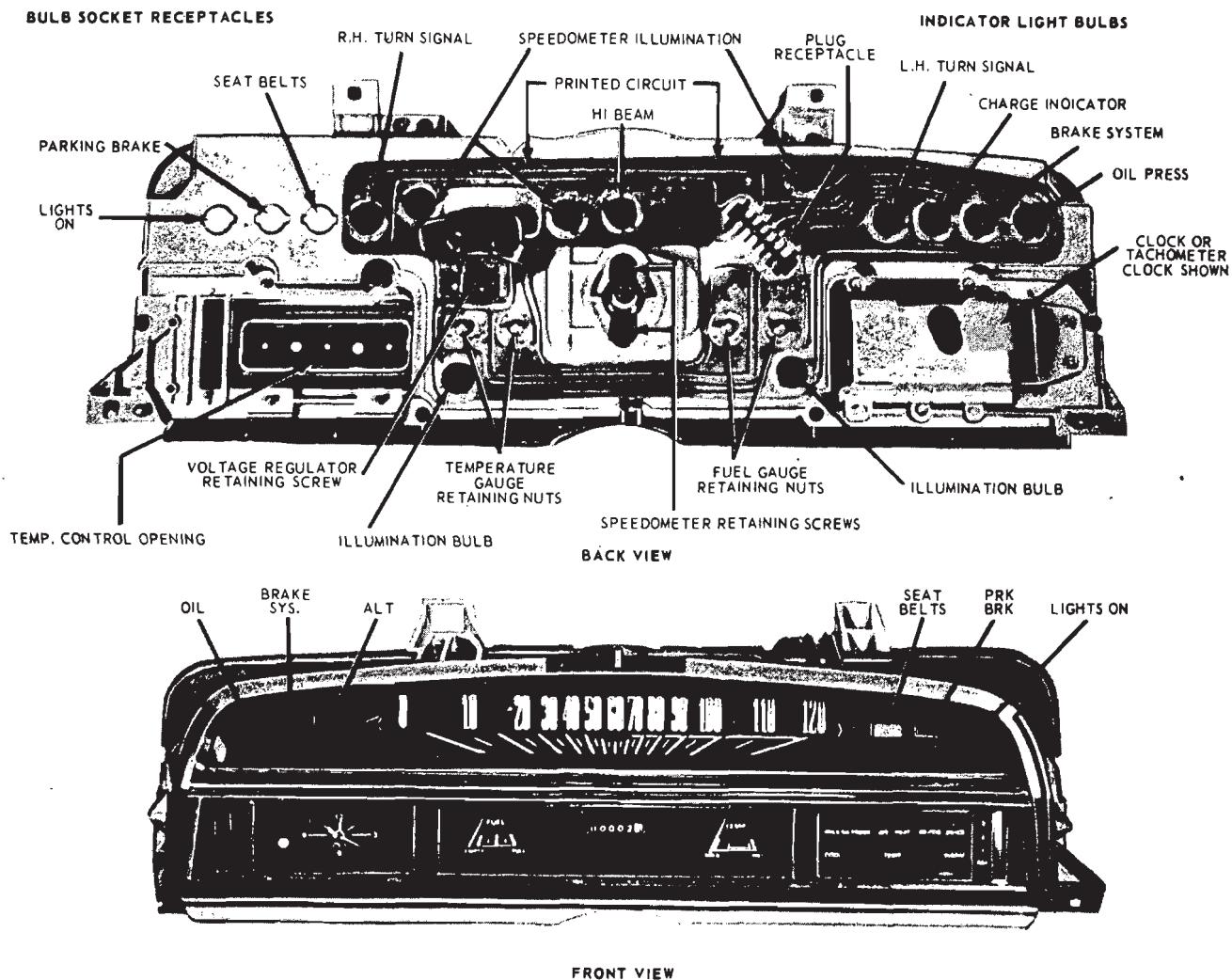


FIG. 15—Fairlane Instrument Cluster

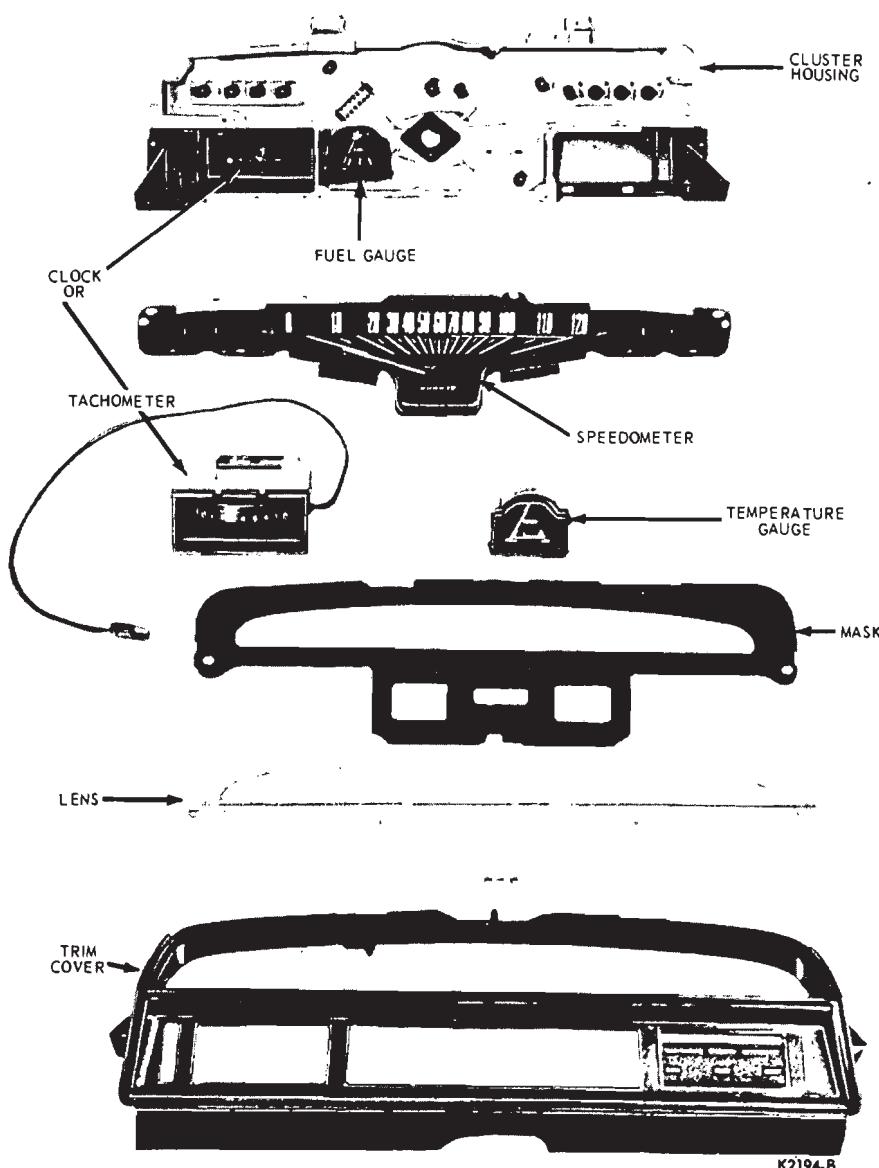


FIG. 16—Fairlane Instrument Cluster Disassembled

Disengage the three wiring harness-connected indicator light bulb and socket assemblies from their receptacles (Fig. 15). Disconnect the cable and five vacuum hoses from the heater control. Disconnect the feed plug to the heater control switch and the connector to the heater control light bulb. Remove the cluster.

INSTALLATION

1. While holding the instrument cluster near its opening in the instrument panel, connect: the feed plug to the heater control switch and the heater control light bulb to its feed connector; the cable and the five vacuum hoses to the heater control; the three lights (from the wiring harness) into their socket receptacles (Fig. 15);

the multiple feed plug to the printed circuit; and the feed plug to either the clock or tachometer (if so equipped).

2. Position the cluster to the instrument panel and install the four retaining screws.

3. Install the instrument panel pad (See Part 47-03).

4. Connect the battery ground cable.

PRINTED CIRCUIT

Remove the instrument cluster as described in the foregoing procedure. Disconnect (snap off) the printed circuit connector buttons from the voltage regulator. Remove the regulator from the cluster (one retaining screw). Remove the four gauge retaining nuts

and the eleven light bulbs that hold the printed circuit to the back of the cluster (Fig. 15). Remove the printed circuit from the cluster.

When installing the printed circuit to the cluster, carefully position it over the plastic locating dowels.

INSTRUMENTS

To gain access to the instruments, first remove the instrument cluster from the instrument panel as outlined under **Instrument Cluster**, and then remove the trim cover, lens and mask from the front of the cluster by removing the six retaining screws and two heater control knobs (Fig. 16).

After removing and installing any one of the instrument assemblies as outlined in the following procedures, position in order the mask, the lens and the trim cover to the front side of the cluster and install the retaining screws. Install the two heater control knobs.

TEMPERATURE AND FUEL GAUGES

To remove either gauge, remove the retaining nuts at the back side of the cluster (Fig. 15) and withdraw the gauge from the front side.

Install the gauge from the front of the cluster with the studs entering the holes in the cluster housing (Fig. 16). Install the retaining nuts on the studs from the rear (Fig. 15).

SPEEDOMETER

To remove the speedometer, remove the retaining screws at the back side of the cluster (Fig. 15) and remove the three speedometer retaining screws from the front side (Fig. 16). Pull the speedometer out from the front.

Position the speedometer to the front side of the cluster housing and install three retaining screws from the front (Fig. 16). Install two retaining screws from the back side of the housing (Fig. 15).

CLOCK OR TACHOMETER

Either a clock or tachometer is installed on the lower left side of the cluster depending upon the model. They are both removed and installed in the same manner.

Remove the three retaining screws and withdraw the assembly from the back side of the cluster (Fig. 15).

13 MONTEGO—REMOVAL AND INSTALLATION

INSTRUMENT VOLTAGE REGULATOR AND INDICATOR BULBS

To gain access to the regulator or light bulbs, remove the left finish panel (two retaining screws) at the lower edge of the instrument cluster. This panel can be identified by the Lights and Wiper/Washer labels. After removing the finish panel, these parts can be removed from the bottom of the cluster by reaching under the instrument panel (Bottom view, Fig. 17).

To replace the voltage regulator, remove the regulator-to-cluster retaining screw and disconnect (snap off) the printed circuit connector buttons from the regulator.

To replace any of the light bulbs, turn the bulb and socket assembly counterclockwise and remove. Position a new bulb and socket assembly to the printed circuit and turn clockwise.

INSTRUMENT CLUSTER

Remove the heater control and left finish panels and the instrument panel pad as outlined in Part 47-03. From the front of the cluster, remove the four cluster-to-instrument panel retaining screws and position the cluster part way out of the panel. Disconnect the speedometer cable and the cluster feed plug from its receptacle in the printed circuit (Back view, Fig. 17). Disconnect the electrical plug to the clock and remove the cluster.

When installing the cluster, first position it near the opening in the instrument panel and then connect the speedometer cable to the speedometer and the electrical plugs to the printed circuit and clock. Mount the cluster to the panel and install the four retaining screws.

Install the instrument panel pad and the heater control and left finish panels as outlined in Part 47-03.

PRINTED CIRCUIT

Remove the instrument cluster from the instrument panel as outlined in the foregoing procedure. Remove the plastic cover from the fuel gauge mounting studs. Remove the fuel gauge retaining nuts (back view, Fig. 17), the voltage regulator retaining screw and the light bulbs (bottom

view, Fig. 17) all of which retain the printed circuit to the cluster. Remove the printed circuit from the cluster and disconnect (snap off) the printed circuit connector buttons from the voltage regulator.

When installing the printed circuit be sure to properly position it over the locating dowels on the back and bottom of the cluster (Fig. 17).

CLOCK

Remove the instrument cluster from the instrument panel as outlined under Instrument Panel. Remove the four clock-to-cluster retaining screws at the back side of the cluster and withdraw the clock from the rear of the cluster (Figs. 17 and 18).

If the clock is to be sent out for repair, install the instrument cluster without the clock.

SPEEDOMETER, FUEL GAUGE AND LENS

1. Remove the instrument cluster from the instrument panel as outlined under Instrument Cluster.

2. Remove the cluster trim cover (seven retaining screws) from the front of the cluster (Fig. 18).

If only the lens assembly is being replaced, follow steps 3 and 4, then skip steps 5 through 8 and proceed with step 9. If the lens assembly is not being replaced, skip steps 3 and 4 and proceed with step 5.

3. Remove the four rubber spacers that hold the lens assembly to the mask and remove the lens from the mask (Fig. 18).

4. Install the new lens to the mask and then install the rubber spacers.

5. Remove the mask and lens assembly from the instrument cluster (eight retaining screws) (Fig. 18).

6. To replace the speedometer assembly, remove the retaining screws at the back of the cluster (Back view, Fig. 17) and pull the speedometer from the front of the cluster housing (Fig. 18).

When installing the speedometer, insert the cable connection through the opening from the front of the cluster housing and position it so that the screw holes match (Fig. 18). Install the retaining screws from the back side of the cluster (Fig. 17).

7. To replace the fuel gauge, remove the plastic cover from the

mounting studs and remove the retaining nuts from the back of the cluster (back view, Fig. 17). Remove the gauge from the front of the cluster housing (Fig. 18).

When installing the fuel gauge, insert the mounting studs through the stud holes from the front of the cluster housing and install the retaining nuts from the back side. Replace the plastic cover.

8. Install the mask and lens assembly (Fig. 18) to the cluster housing (eight retaining screws).

9. Install the cluster trim cover to the cluster housing (seven retaining screws).

10. Install the instrument cluster in the instrument panel as outlined under Instrument Cluster.

AUXILIARY INSTRUMENT CLUSTER—CYCLONE SPOILER

DESCRIPTION AND OPERATION

In addition to the main instrument cluster, the Cyclone Spoiler model is equipped with an auxiliary cluster which is mounted in the right side of the instrument panel pad and retainer assembly. The temperature, oil pressure, and charge indicator lights are omitted from the main cluster. The auxiliary cluster contains a tachometer, an oil pressure gauge, an engine temperature gauge and an ammeter (Fig. 19).

LIGHT BULBS

From underneath the instrument panel pad, reach up behind the cluster and turn the bulb and socket assembly counterclockwise to disengage it from the cluster (Fig. 19).

Lower the light and lead wire from behind the panel pad, remove the old bulb from the socket and install a new one. Place the bulb and socket assembly in its receptacle in the back side of the cluster and turn clockwise.

CLUSTER

Remove the instrument panel pad assembly as outlined in Part 47-03. From the inner side of the pad assembly, remove the four cluster-to-pad retaining nuts from the mounting studs and lift the cluster out of the pad.

Install the cluster to the inner side

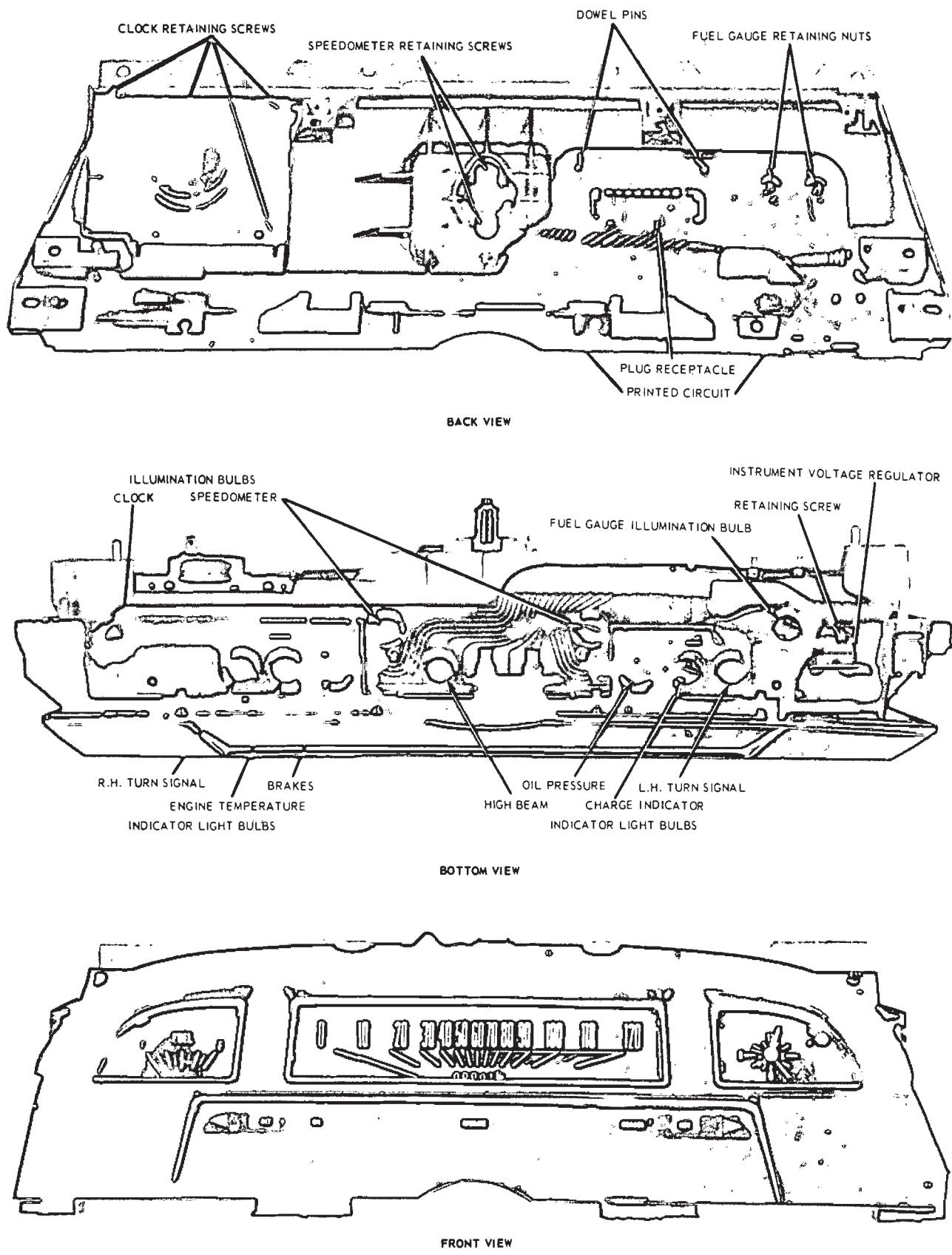


FIG. 17—Montego Instrument Cluster

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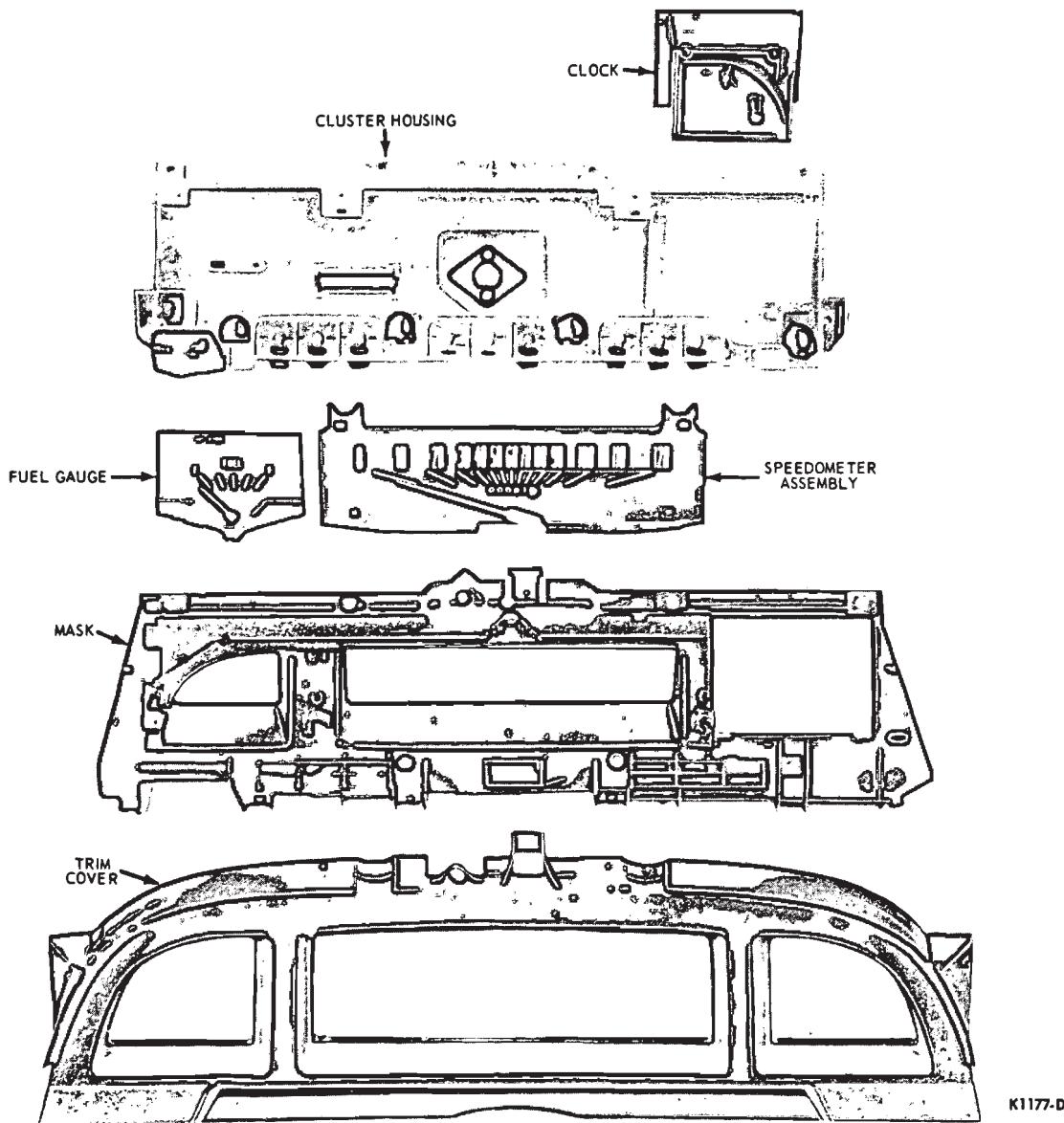


FIG. 18—Montego Instrument Cluster—Disassembled

of the panel pad assembly making sure that the mounting studs in the pad enter the stud holes in the cluster assembly. Install the four retaining nuts to the studs. Install the instrument panel pad assembly to the instrument panel as outlined in Part 47-03.

INSTRUMENT VOLTAGE REGULATOR

Remove the instrument panel pad assembly as outlined in Part 47-03. The cluster assembly does not have to be removed from the pad. The voltage regulator is accessible from the inner side of the pad.

Disconnect the two wires from the terminals on the regulator, remove the retaining screw, and remove the

regulator from the cluster (Fig. 19).

INSTRUMENTS

1. Remove the instrument cluster as outlined under Cluster.

2. If the tachometer is being removed, remove the nuts from the three mounting studs at the back of the cluster assembly (Fig. 19).

To remove the ammeter, temperature gauge or oil pressure gauge, disconnect the wires from the two gauge terminals at the back of the cluster assembly and remove the two retaining nuts.

3. From the front side of the cluster, remove the retaining nuts and separate the trim cover and lens assembly from the cluster housing (Fig. 20).

4. Pull the instrument out from the front of the cluster housing.

5. Install the instrument to the cluster housing from the front side so that the mounting studs enter the stud holes in the housing (Fig. 20).

6. Position the trim cover and lens assembly to the front of the cluster housing, and install the retaining screws (Fig. 20).

7. If the tachometer is being installed, install the retaining nuts on the three mounting studs at the back of the cluster (Fig. 19). If the ammeter, temperature gauge, or oil pressure gauge is being installed, install the two retaining nuts and connect the wires to the two gauge terminals as shown.

8. Install the instrument cluster as outlined under Cluster.

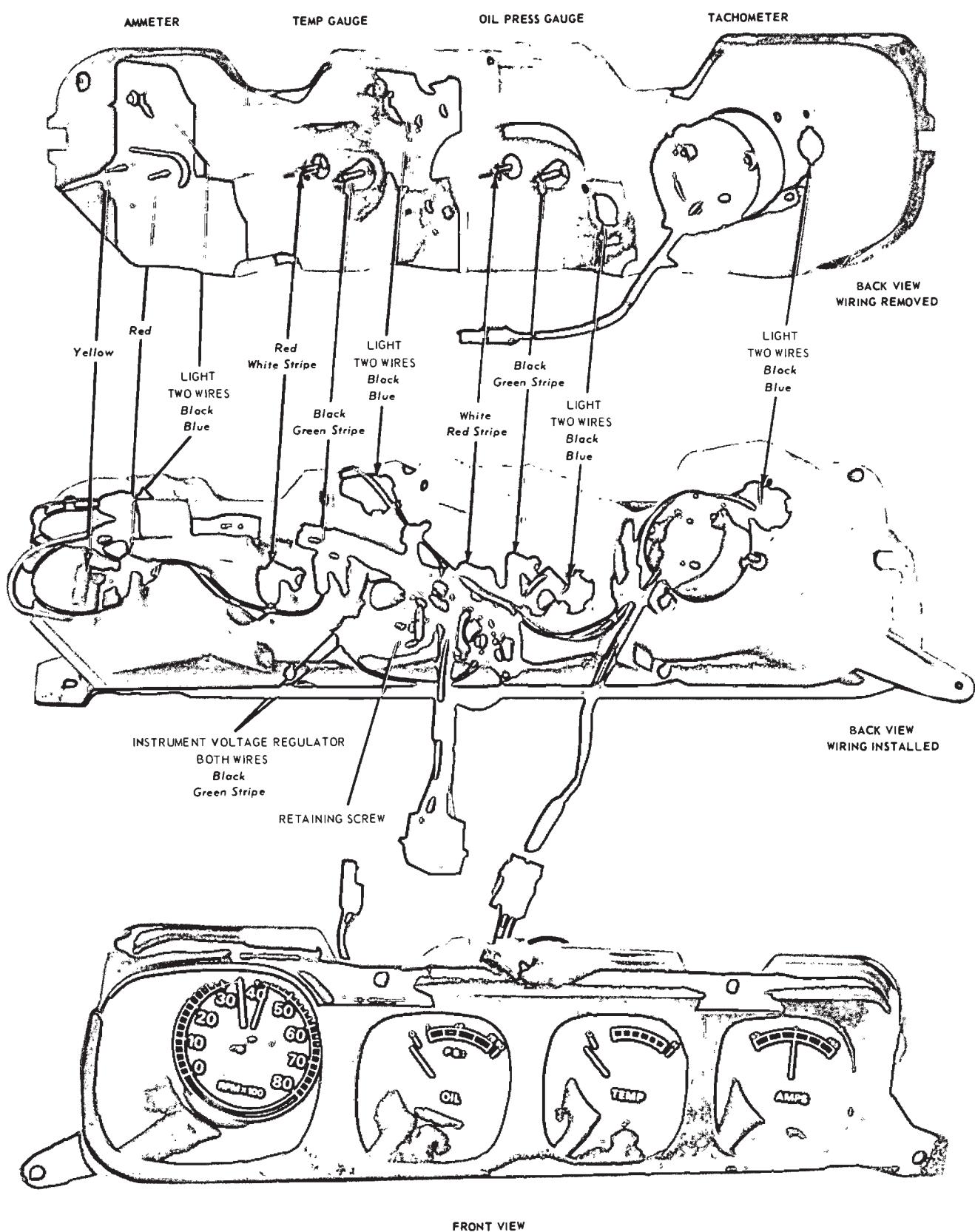


FIG. 19—Montego Auxiliary Instrument Cluster—Cyclone Spoiler Models

K1179-D

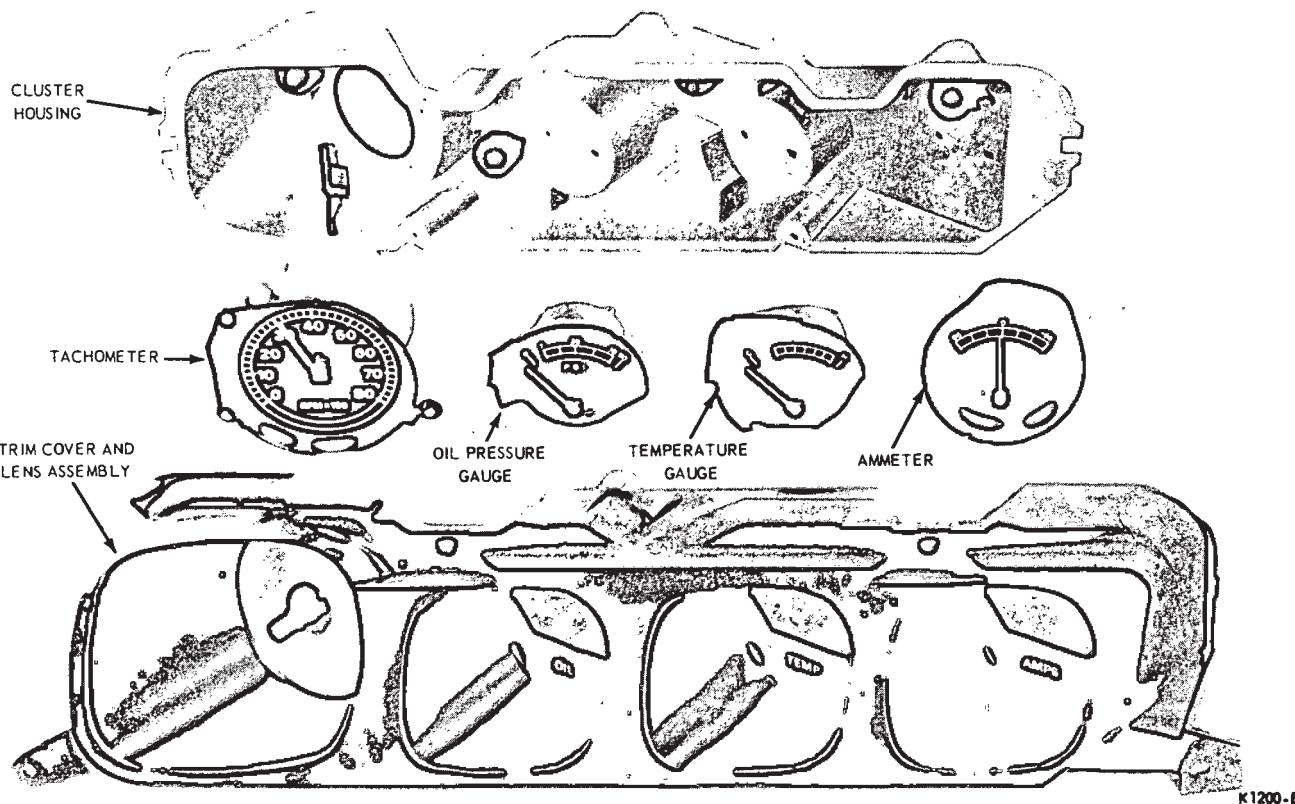


FIG. 20—Montego Auxiliary Instrument Cluster—Disassembled

14 LINCOLN CONTINENTAL—REMOVAL AND INSTALLATION

CLUSTER ILLUMINATION AND INDICATOR LIGHT BULBS

Bulb replacement does not require removal of the cluster housing or the clusters. Eight illumination bulbs and seven indicator bulbs are connected into one of two printed circuits and are identified in Fig. 21. The bulb and socket assemblies of three illumination lights and two indicator lights are connected to wires leading from the 14401 wiring harness. The socket receptacles for these lights are also identified in Fig. 21.

To gain access to the bulbs on the left side (right side as viewed from the rear, Fig. 21), it will be necessary to disconnect and remove the headlight switch. To gain access to the upper center lights, it will be necessary to remove the air conditioning duct as outlined in Group 34.

To replace any one of the printed-circuit connected bulbs, reach from underneath the instrument panel, turn

the bulb and socket assembly counterclockwise and remove. Position the new bulb and socket assembly to the printed circuit and turn clockwise.

To replace any one of the wiring harness-connected bulbs, disengage the bulb and socket assembly from the cluster housing by turning counterclockwise. Remove the old bulb from the socket and install a new one. Position the bulb and socket assembly in the socket receptacle and turn clockwise.

INSTRUMENT CLUSTER

Remove the instrument panel pad. The cluster trim cover (Figs. 22 and 24) does not have to be removed if only the instrument cluster is being removed.

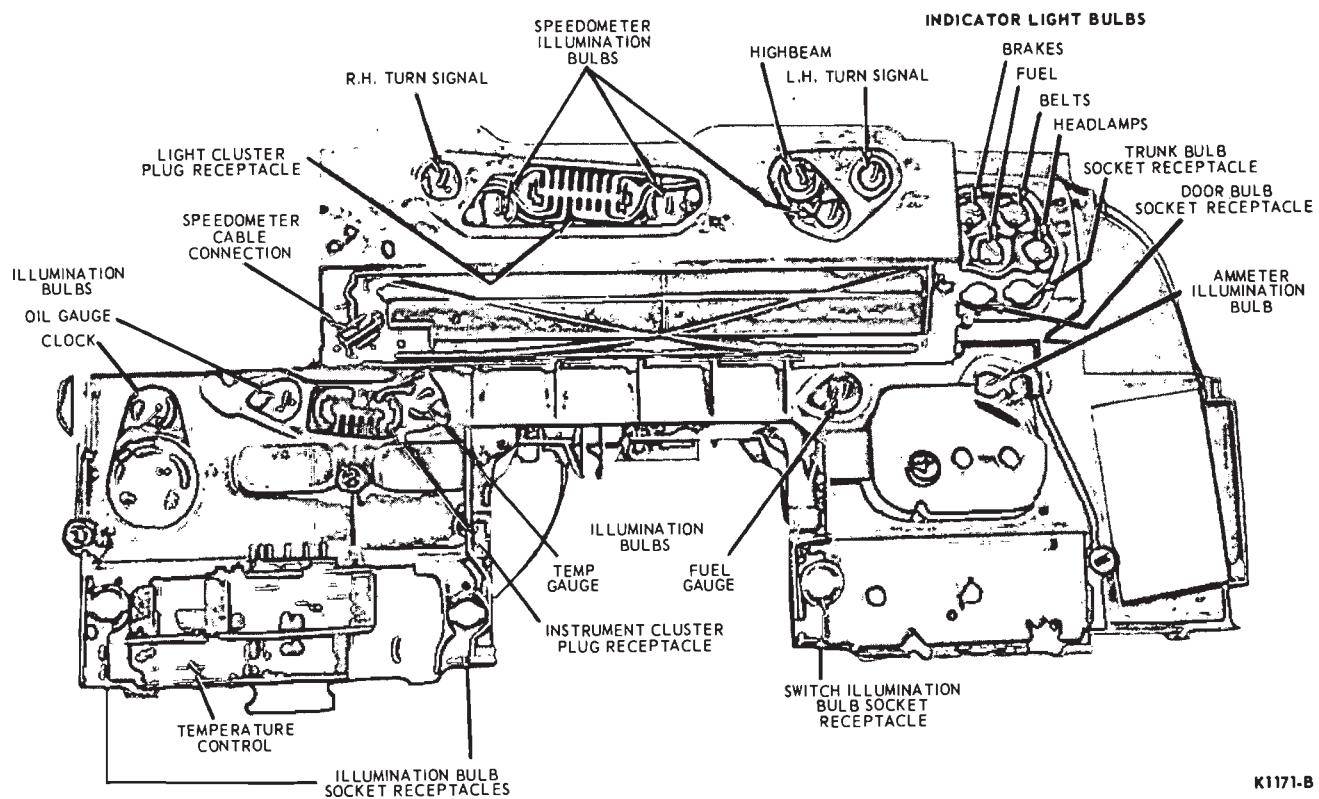
Reach under the instrument panel and disconnect the instrument cluster printed circuit plug from its receptacle (Fig. 21). From the passenger side of the instrument panel, remove the

cluster-to-cluster housing retaining screws and swing the cluster away from the housing. From the underside of the cluster, unhook the pointer control cable wire from the PRNDL pointer lever (Fig. 22). Remove the cable retaining clip (one nut) from the cluster and remove the cluster from the vehicle.

Before installing the cluster, be sure to connect the control wire to the PRNDL pointer and attach the cable to the cluster with the retaining nut. Carefully position the cluster so that the dowels on the rear side of the cluster securely index into the dowel holes in the cluster housing.

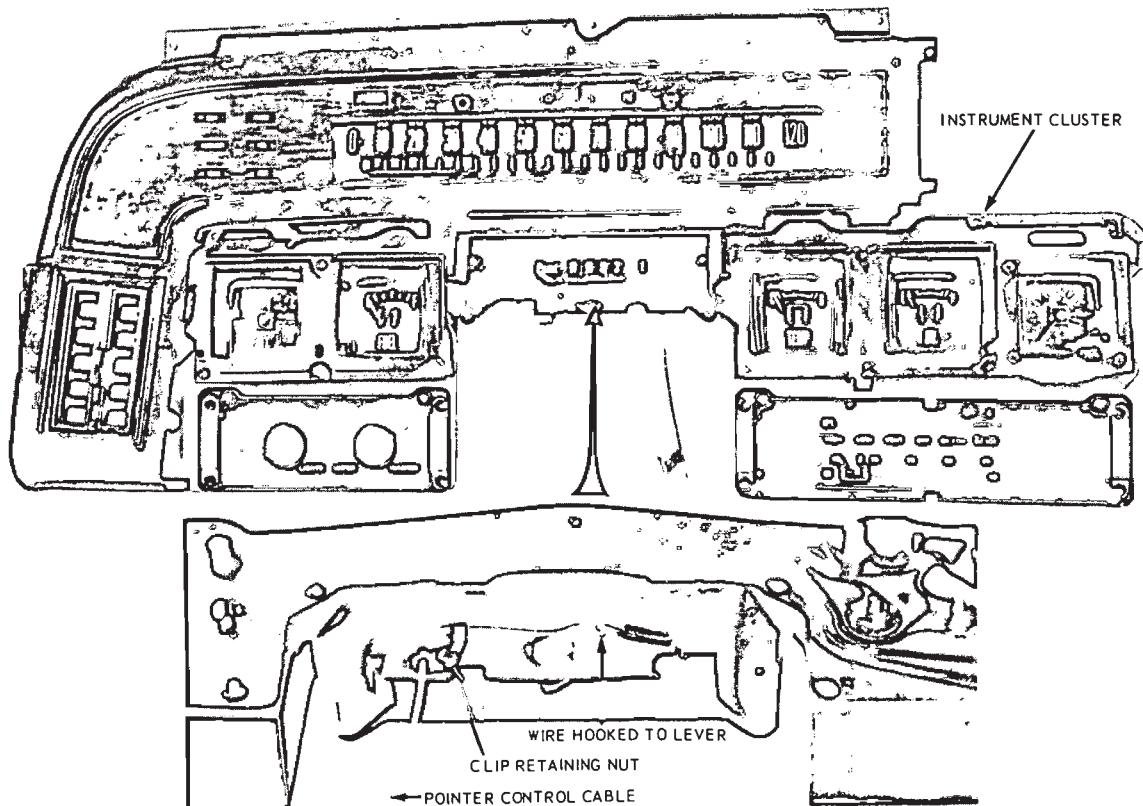
VOLTAGE REGULATOR AND PRINTED CIRCUIT

Remove the instrument cluster as outlined in the foregoing procedure. The voltage regulator has to be removed before the printed circuit can be removed. Remove the retaining



K1171-B

FIG. 21—Lincoln Continental Cluster Housing—Rear Assembled View



K1642-C

FIG. 22—Lincoln Continental Cluster Housing—Front Assembled View

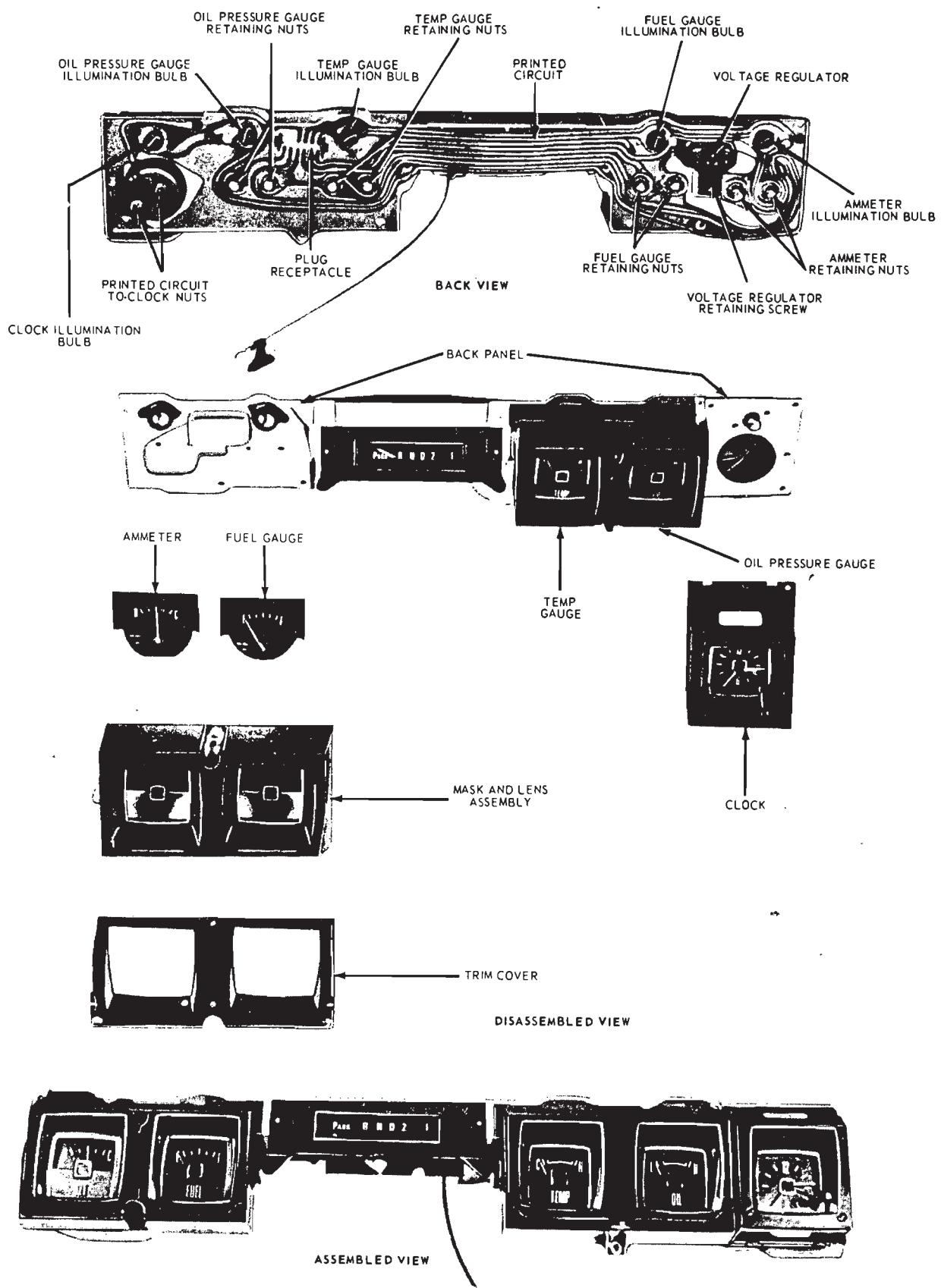


FIG. 23—Lincoln Continental Instrument Cluster

K1172-C

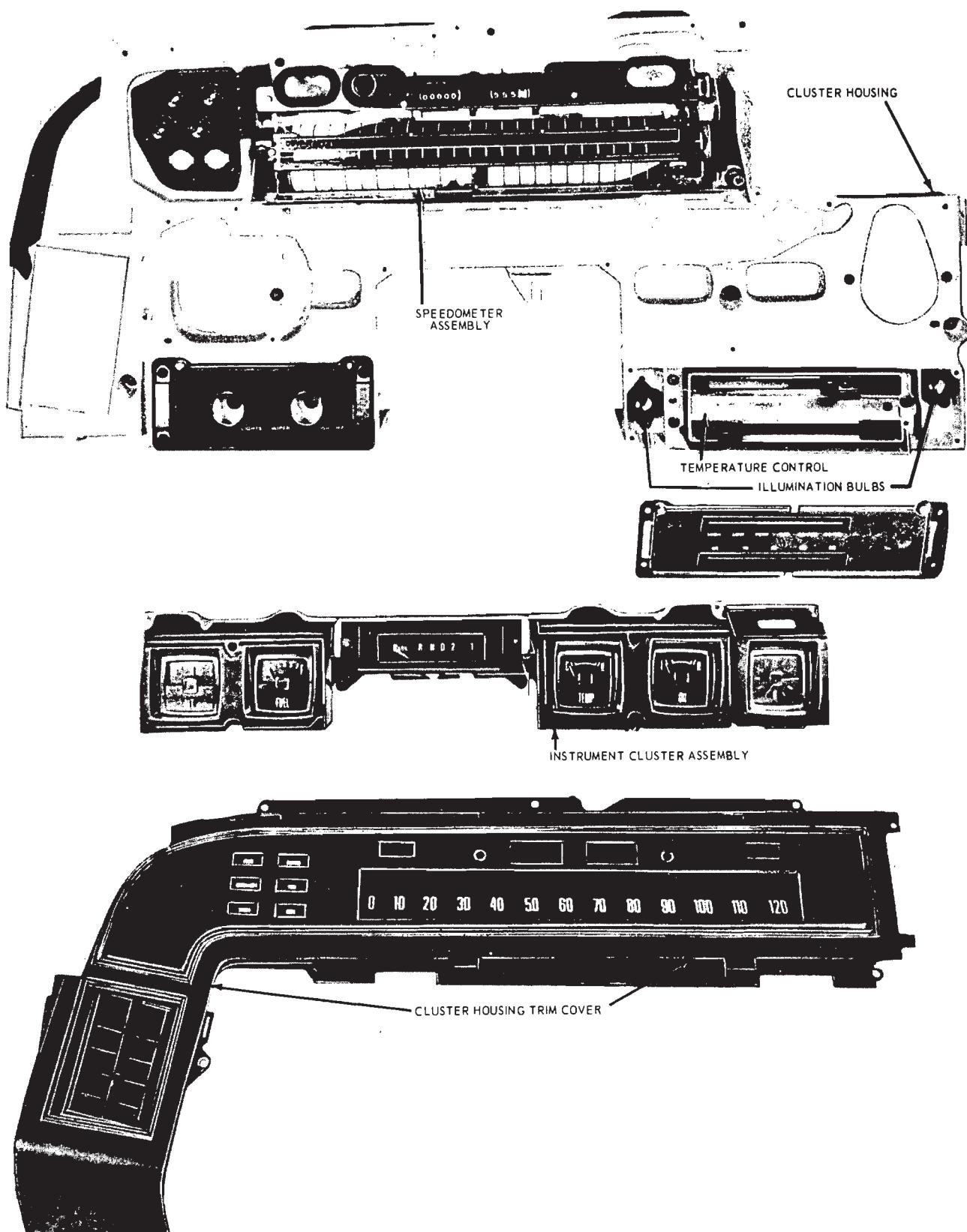
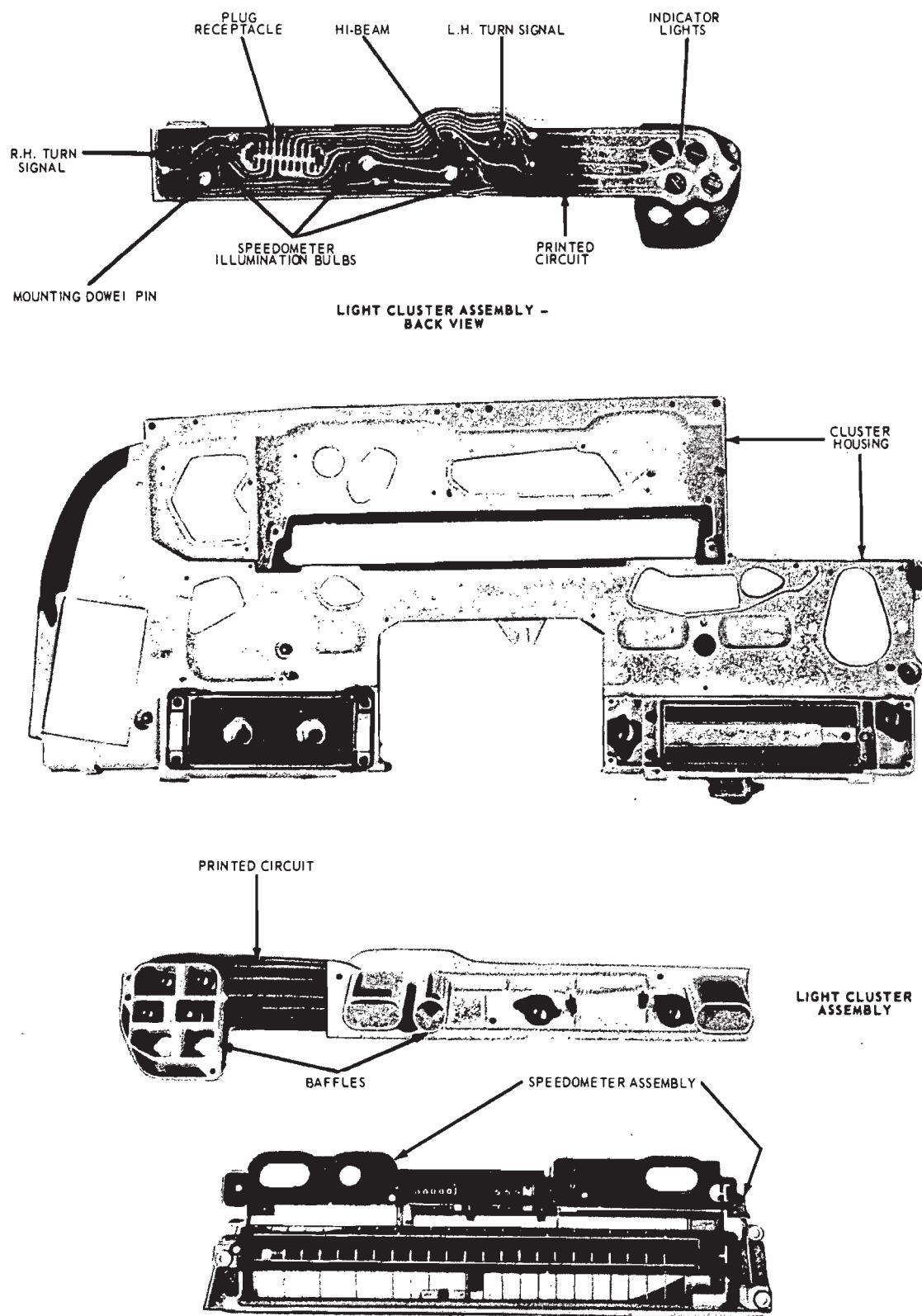


FIG. 24—Disassembly of Lincoln Continental Cluster Housing

K1641-C



K1174-D

FIG. 25—Removing or Installing Speedometer and Light Cluster Assemblies—Lincoln Continental

screw and remove the voltage regulator from the printed circuit (Back view, Fig. 23). Disconnect the printed circuit from the clock terminals (two nuts). Remove the eight instrument retaining nuts and the five illumination bulbs that hold the printed circuit to the cluster back panel. Remove the printed circuit.

When installing the printed circuit, take care to position it properly over the locating dowels before installing the bulbs and retaining nuts.

AMMETER, FUEL, TEMP AND OIL GAUGES

The removal and installation procedure is identical for all four gauges. Removal of any one of the gauges requires removal of the cluster assembly from the cluster housing as outlined under Instrument Cluster.

To remove a gauge, first remove the two gauge retaining nuts at the back of the cluster (Back view, Fig. 23). From the front of the cluster, remove the trim cover and the mask and lens assembly that covers the gauge to be removed (four retaining screws) and withdraw the gauge from the cluster (Disassembled view, Fig. 23).

Install the gauge so that the gauge studs enter the stud holes in the cluster back panel and printed circuit, and secure with the retaining nuts. Position the mask and lens assembly and the trim cover over the gauge and install the retaining screws.

CLOCK

Before removing the clock, the instrument panel pad has to be removed for access to the clock retaining screws, but the instrument cluster does not have to be removed from the cluster housing.

Remove the instrument panel pad, and disconnect the battery. From the

front of the instrument panel remove the clock-to-cluster back panel retaining screws, and separate the clock from the back panel (Fig. 23). Take care not to damage the printed circuit connecting straps. Disconnect the clock from the printed circuit by removing the terminal nuts at the back of the clock.

When installing the clock, carefully connect the printed circuit straps to the clock terminals before positioning the clock to the cluster back panel.

SPEEDOMETER

Remove the retaining screws and remove the cluster housing trim cover from the cluster housing (Fig. 24). Reach up behind the instrument panel and disconnect the speedometer cable (Fig. 21). Remove the speedometer-to-cluster housing retaining screws and lift the speedometer from the cluster housing (Fig. 25).

When installing the speedometer to the housing, guide the cable connection carefully through its opening in the housing.

LIGHT CLUSTER AND PRINTED CIRCUIT

A small separate cluster and printed circuit assembly for all the indicator lights and the speedometer illumination bulbs is installed along the upper surface of the cluster housing behind the speedometer (Fig. 25).

REMOVAL

1. Disconnect the battery.
2. Remove the headlight switch to gain access to the wiring harness-connected indicator lights in the cluster.
3. Reach up behind the left side of the instrument panel and disengage the trunk and door indicator light bulb and socket assemblies from the

cluster (Fig. 21). Rotate 1/4 turn counterclockwise to disengage.

4. Remove the air conditioning duct from behind the center of the cluster housing (Refer to Group 34) to gain access to the light cluster printed circuit plug. Disconnect the plug from the printed circuit.

5. Remove the speedometer assembly from the cluster housing as described in the foregoing procedure.

6. Remove the baffles and cluster assembly from the cluster housing (Fig. 25).

7. Remove the ten light bulbs, and then lift the printed circuit from the cluster panel (Back view, Fig. 25).

INSTALLATION

1. Position the printed circuit over the mounting dowels and install the ten light bulbs (Back view, Fig. 25).

2. Mount the light cluster assembly to the cluster housing by inserting the dowel pins on the back of the cluster into the dowel holes in the housing. Install the baffles.

3. Mount the speedometer assembly to the housing carefully guiding the cable connection through its opening in the housing. Install the retaining screws.

4. Reaching up behind the instrument panel, connect the speedometer cable to the speedometer and insert the light cluster connector plug into its receptacle in the printed circuit (Fig. 21).

5. Reach up behind the left side of the instrument panel and engage the trunk and door indicator light bulb and socket assemblies into their receptacles by rotating 1/4 turn clockwise (Fig. 21).

6. Install the air conditioning duct behind the center of the instrument panel as described in Group 34.

7. Install the headlight switch and connect the battery.

15 THUNDERBIRD—REMOVAL AND INSTALLATION

INSTRUMENT CLUSTER BEZEL AND MASK

REMOVAL

1. Disconnect the battery ground cable.
2. Remove five screws attaching

the top of the cluster bezel to the instrument panel.

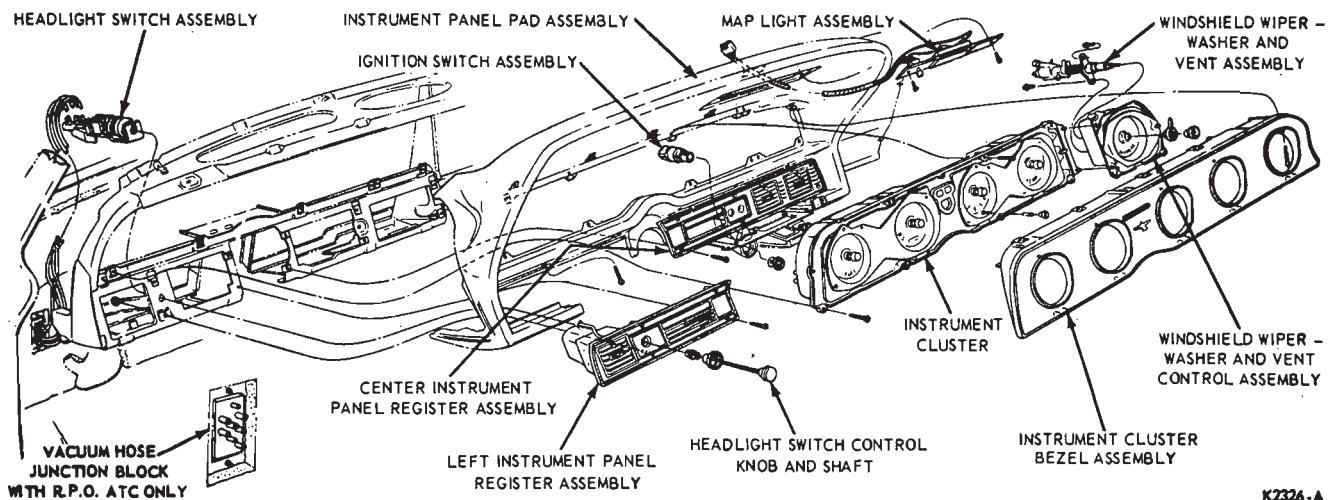
3. Loosen five screws attaching the bottom of the bezel to the instrument panel pad retainer, and remove the bezel.

4. Remove the adjustment knob from the clock.

5. Remove eight push button retainers and remove the mask and lens from the cluster (Fig. 26).

INSTALLATION

1. Position the mask and lens to the cluster, and install the eight push



K2326-A

FIG. 26—Instrument Cluster Installation—Thunderbird

button retainers and the clock adjustment knob.

2. Position the bezel to the cluster. Install the five upper attaching screws and tighten the five lower attaching screws.

3. Connect the battery ground cable.

INSTRUMENT CLUSTER

REMOVAL

1. Remove the bezel and mask as outlined in the foregoing procedure.

2. Remove three speedometer attaching screws and remove the speedometer.

3. Remove two screws attaching the speedometer cable retainers to the cluster. Pull the plastic collar and speedometer cable into the cluster. Then, depress the flat surface of the cable housing as shown in Fig. 5, and pull the speedometer cable housing off the collar.

4. Remove eight screws attaching the cluster to the instrument panel.

5. Remove three screws attaching the rear vent and wiper control assembly to the instrument panel.

6. Pull the cluster away from the instrument panel; disconnect the connector from the cluster; and remove the cluster from the vehicle.

INSTALLATION

1. Position the cluster to the in-

strument panel; plug the connector into the cluster printed circuit; and insert the speedometer cable through the hole in the cluster.

2. Install the eight cluster attaching screws.

3. Position the speedometer collar to the cable housing. Align the collar with the housing and push the collar on the housing with a twisting motion until the catch is engaged.

4. Position the collar in the cluster and install the two retainers.

5. Position the speedometer to the cluster and install the three attaching screws.

6. Install the rear vent and wiper control assembly.

7. Install the bezel and mask as outlined in the foregoing procedure.

CLUSTER ILLUMINATION AND INDICATOR BULBS, AND PRINTED CIRCUIT

1. Remove the bezel and mask and the instrument cluster as outlined in the foregoing procedures.

2. Remove the bulbs and sockets from the back of the cluster.

3. Remove fifteen screws and one push button retainer attaching the printed circuit to the back of the cluster, and remove the printed circuit.

4. Position the printed circuit to the cluster and install the fifteen screws and push button retainer.

5. Install the lights and sockets in

the back of the cluster.

6. Install the instrument cluster and the bezel and mask as outlined in the foregoing procedures.

INSTRUMENT VOLTAGE REGULATOR

1. Remove the cluster bezel and mask as outlined in this section.

2. Remove the one attaching screw and remove the regulator from the cluster.

3. Position the replacement regulator to the cluster and install the attaching screw.

4. Install the cluster bezel and mask as outlined in this section.

INSTRUMENT CLUSTER GAUGES, SPEEDOMETER AND CLOCK

The charge indicator gauge (Ammeter) is protected by a 14-ampere fuse in the fuse panel. Always check the fuse to be sure it is good before replacing the charge indicator gauge. The speedometer and the clock, and the charge indicator, fuel, oil and temperature gauges are each retained in the instrument cluster by three retaining screws. To replace any one of these units, remove the cluster bezel and mask as outlined in this section. Remove the mounting screws and the unit being replaced.

16 CONTINENTAL MARK III—REMOVAL AND INSTALLATION

INSTRUMENT CLUSTER

REMOVAL

1. Disconnect the battery ground cable.
2. Remove five screws retaining the upper edge of the instrument cluster pad and retainer assembly to the instrument panel pad, and remove the pad and retainer assembly from the face of the instrument cluster.
3. Remove the clock knob. Remove the eight push type retainer buttons from the instrument cluster mask and remove the mask.
4. Remove the three screws retaining the speedometer to the cluster and pull the speedometer from the cluster. Disconnect the two speedometer cable-to-cluster retaining screws and clamps, release the tab of the plastic retainer and remove it from the cable. If equipped with speed control, the speedometer cable may be disconnected at the speed control unit instead.
5. Remove the eight screws retaining the instrument cluster to the instrument panel. Remove the three screws retaining the rear vent and wiper control pod. Pull the cluster and pod out of the panel.
6. Disconnect the multiple connector and the low fuel warning and dual brake warning lights at the printed circuit, and remove the instrument cluster.

INSTALLATION

1. Connect the instrument cluster multiple connector to the printed circuit. Install the low fuel warning and dual brake warning lights to the cluster.
2. Guide the speedometer cable through the cluster housing and install the plastic retainer to the cable.
3. Position the instrument cluster to the panel and install the eight retaining screws. Install the two speedometer cable retaining screws and clamps.
4. Position the speedometer to the cluster and install the three retaining screws. (Connect the speedometer cable to the speed control unit, if so equipped.)
5. Position the rear vent and wiper control pod to the panel and install

the three retaining screws.

6. Position the instrument cluster mask and install the eight push type retainer buttons. Install the clock knob.
7. Position the instrument cluster pad and retainer assembly to the face of the cluster and install the five screws retaining the upper edge of the pad to the instrument panel pad.
8. Connect the battery ground cable.

INSTRUMENT CLUSTER PRINTED CIRCUIT

To replace the instrument cluster printed circuit, remove the instrument cluster by following the procedure under Instrument Cluster Removal. Then remove the eight bulb and socket assemblies from the cluster back. Remove the push-in button and 15 screws retaining the printed circuit to the cluster, and remove the printed circuit. Position the new printed circuit to the cluster back and install the retaining screws and push-in button. Install the bulb and socket assemblies. Install the instrument cluster, following the procedure under Instrument Cluster Installation. Test the operation of the gauges and lights.

INSTRUMENT VOLTAGE REGULATOR

The instrument voltage regulator is located within the instrument cluster housing, between the speedometer and the oil pressure and fuel level gauges. To remove it, follow steps 1 through 3 under Instrument Cluster Removal. Then remove the screw retaining the instrument voltage regulator and pull the regulator from the cluster. To install, position the instrument voltage regulator to the cluster, pressing to insure proper connection to the printed circuit, and install the retaining screw. Complete the installation by following steps 6 through 8 under Instrument Cluster Installation.

INSTRUMENT CLUSTER GAUGES

Individual instrument cluster gauges (Fig. 27) may be removed by following steps 1 through 3 under In-

strument Cluster Removal. Then remove the screw(s) retaining the individual gauge, and remove the gauge. To install press the gauge into position in the cluster housing to insure a good connection with the printed circuit, and install the retaining screw(s). Complete the installation by following steps 6 through 8 under Instrument Cluster Installation. Check the gauge operation.

SPEEDOMETER

To remove the speedometer, follow steps 1 through 3 under Instrument Cluster Removal. Then remove the three screws retaining the speedometer to the cluster, and pull the speedometer from the cluster. Transfer the speedometer mounting plate to the replacement speedometer. Install the speedometer with the three retaining screws. Complete the installation by following steps 6 through 8 under Instrument Cluster Installation.

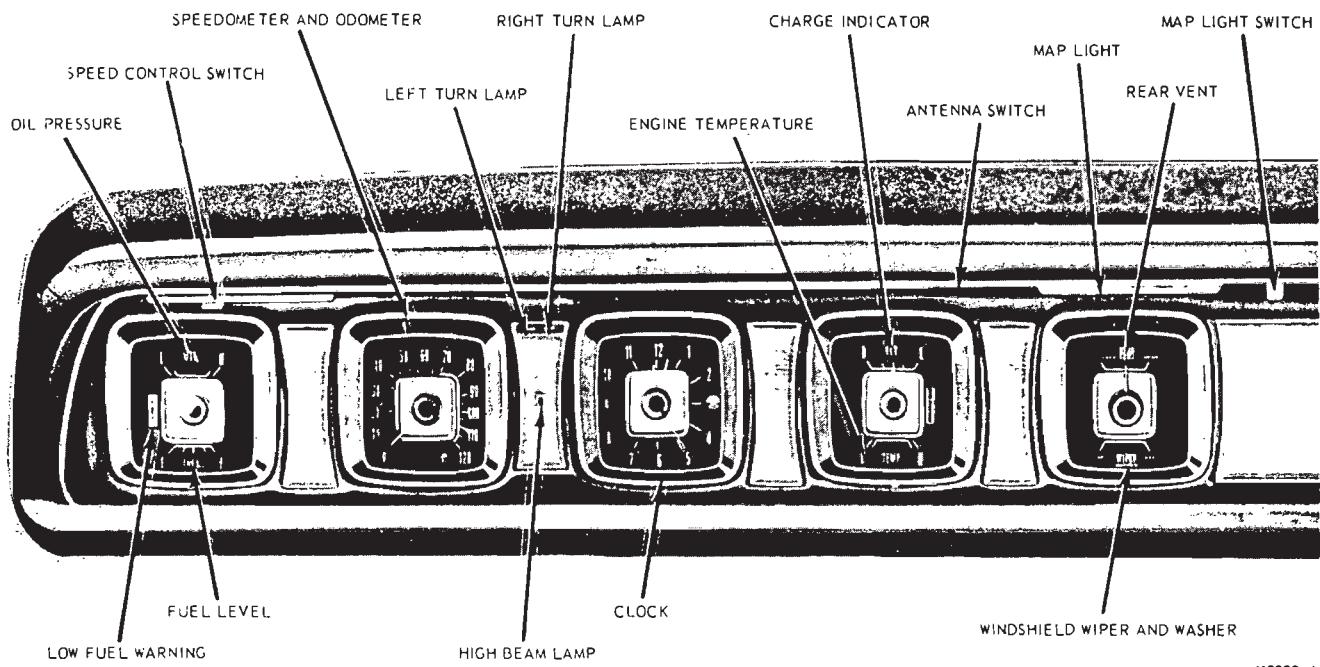
CLOCK

REMOVAL

1. Disconnect the battery ground cable.
2. Remove the instrument cluster pad and mask, following steps 2 and 3 under Instrument Cluster Removal.
3. Remove three screws retaining the clock to the cluster, and remove the clock.
4. If no replacement clock is to be installed at this time, install the instrument cluster mask and pad and connect the battery ground cable.

INSTALLATION

1. Disconnect the battery ground cable and remove the instrument cluster pad and mask, if installed.
2. Install the clock, pressing it firmly into the printed circuit to insure a good electrical connection. Install the three retaining screws.
3. Install the instrument cluster mask and pad, following steps 6 and 7 under Instrument Cluster Installation.
4. Connect the battery ground cable.



K2398-A

FIG. 27—Instrument Cluster Assembly—Continental Mark III

17 SPECIFICATIONS

SPEEDOMETER

Transmission Mounting Clip Bolt Torque	3-4 1/2 Ft. Lbs.
Cable Nut at Speedometer Head (Lincoln Continental only).....	18-25 In. Lbs.

SPEEDOMETER CALIBRATION TOLERANCE SPECIFICATIONS

Vehicle	30 MPH Actual Speed	60 MPH Actual Speed	Odometer Measure Over Actual 10 Mile Distance
Non-Rental	30-34 MPH	60-66 MPH	9.9-10.5 Miles
Rental	29-33 MPH	58-65 MPH	9.6-10.4 Miles

CK2457-A

Speedometer Specifications